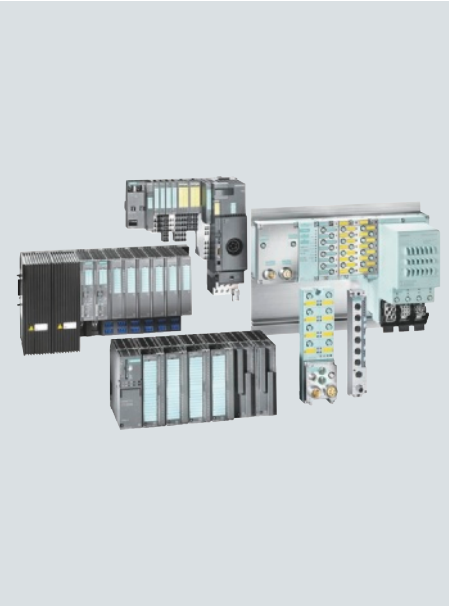


## SIMATIC ET 200 distributed I/O

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- 9/363 Active RS 485 terminating element

**9/364 SIPLUS network components for PROFIBUS**

- 9/364 SIPLUS RS 485 repeater
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**9/366 Network transitions**

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- 9/367 DP/DP coupler

**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

<http://www.siemens.com/simatic/printmaterial>

# SIMATIC ET 200 distributed I/O

## Introduction

### SIMATIC ET 200 distributed I/O

#### Overview



#### **SIMATIC ET 200 offers the right solution for every application**

With SIMATIC ET 200 a wide range of distributed I/O systems is available - for solutions in the control cabinet or without a control cabinet directly at the machine, as well as for applications in hazardous areas. The modular design makes it possible to scale and expand the ET 200 systems simply and in small stages. Already integrated add-on modules reduce costs, and at the same time offer a widely diverse range of possible applications. You can choose from many different combination options: Digital and analog inputs/outputs, intelligent modules with CPU functionality, safety systems, motor starters, pneumatic devices, frequency converters, as well as various different technology modules (e.g. for counting, positioning).

Communication over PROFIBUS and PROFINET, uniform engineering, transparent diagnostic possibilities as well as optimal interfacing to SIMATIC Controllers and HMI units prove the unique integration of Totally Integrated Automation.

#### **PROFIBUS**

PROFIBUS is the international standard (IEC 61158/61784) for the field level. It is the only fieldbus to allow communication both in manufacturing applications and in process-oriented applications.

PROFIBUS is used to connect field devices, e.g. distributed I/O devices or drives, to automation systems such as SIMATIC S7, SIMOTION, SINUMERIK, or PCs.

PROFIBUS is standardized in accordance with IEC 61158 and is a powerful, open and rugged fieldbus system with short response times. PROFIBUS is available in different forms for various applications.

#### **PROFIBUS DP (distributed I/O)**

PROFIBUS DP is used for connecting distributed field devices, e.g. SIMATIC ET 200, or drives with extremely fast response times. PROFIBUS DP is used when sensors/actuators are distributed at the machine or in the plant (e.g. field level).

#### **PROFINET**

PROFINET is the open, cross-vendor Industrial Ethernet standard (IEC 61158/61784) for automation.

Based on Industrial Ethernet, PROFINET enables direct communication between field devices (IO devices) and controllers (IO controllers), up to and including the solution of isochronous drive controls for motion control applications.

As PROFINET is based on Standard Ethernet according to IEEE 802.3, any devices from the field level to the management level can be connected.

In this way, PROFINET enables system-wide communication, supports plant-wide engineering and applies IT standards, such as Web server or FTP, right down to field level. Tried and tested fieldbus systems, such as PROFIBUS or AS-Interface, can be easily integrated without any modification to the existing devices.

#### **AS-Interface**

AS-Interface, the international standard (IEC 62026/EN 50295) which, as an alternative to the cable harness, links especially cost-effective sensors and actuators by means of a two-wire line. This two-wire line is also used to supply the individual stations with power. Thus, the AS-Interface is the ideal partner for the PROFIBUS DP fieldbus.

#### **SIMATIC ET 200 Configurator**

#### **Just a mouse click away from a tailor-made I/O station: With the SIMATIC ET 200 Configurator**

First class support is even provided for configuring the ET 200 station with the ET 200 Configurator. The software tool guides the user through the configuring process and automatically creates order lists complete with accessories. It also assists with compliance with limits such as load currents, slot rules and parameters.

The configuration created in the ET 200 Configurator can be imported into STEP 7 without any problems. This reduces the engineering costs and saves double inputs.

The software tool is structured in a clear, intuitive manner: Six configuring layers make the work easy and convenient.

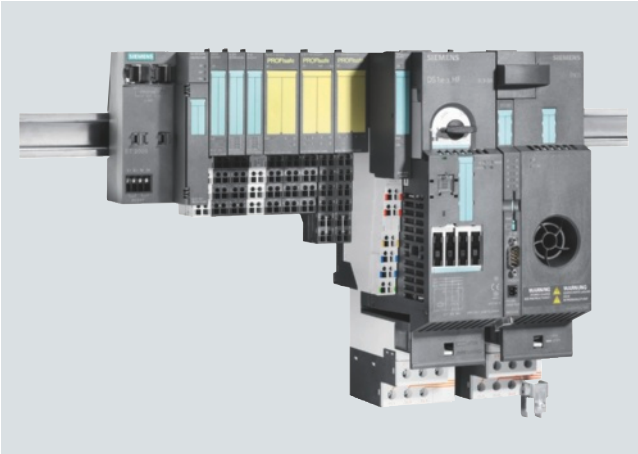
- General notes: General station data as well as a graphical presentation of the configured station
- Module selection: Guided selection of modules, through module suggestions
- Limits: Station size, weight, number of modules, load voltage, parameters, etc. are all displayed
- Accessories: Guided selection of the necessary accessories (module-specific or station-wide)
- Potential distribution: Graphical presentation of the potentials within a station
- Parts list: Automatic generation of a clearly understandable parts list simplifies the ordering process

The ET 200 configurator is a component of the SIMATIC Selection Tool, which is available as a configurator in the Industry Mall.

For brochures serving as selection guides for SIMATIC products refer to:

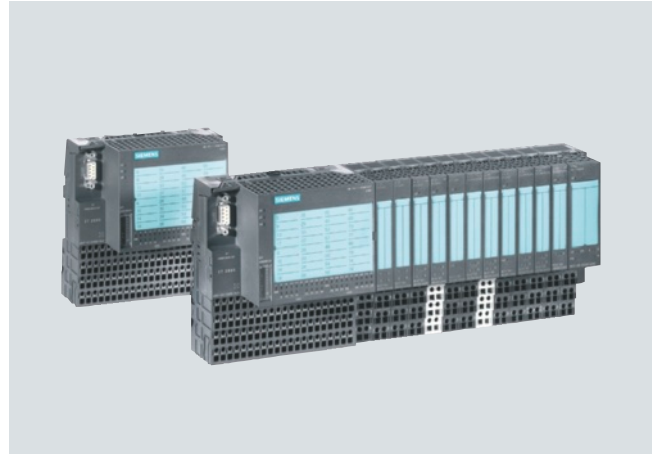
[www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)

### Overview



#### SIMATIC ET 200S

- Distributed I/O system to degree of protection IP20 with minimal wiring outlay, also for extremely time-critical tasks such as high-speed closed-loop controls
- Can be used with integrated S7-CPU as mini PLC:
  - also available as fail-safe PROFIsafe version
  - with optional lower-level PROFIBUS DP
- Discretely-modular design for exact adaptation to the automation task in hand.
- Interface modules available with PROFIBUS DP or PROFINET interfaces
- Can be combined from digital and analog in/output modules, technology modules, motor starters and frequency converters for the control of drives up to 7.5 or 4 kW.
- Exchange of modules during operation (hot swapping), permanent wiring with multi-conductor connection
- Channel-specific diagnostics for high availability
- Can be supplied with integrated fiber optic interface if required
- Transmission rates up to 12 Mbit/s
- FastConnect using unstripped quick connection technology, screw or spring-loaded terminals
- Ex approval to Cat. 3 for Zone 2 acc. to ATEX100 a
- Slot reservation with spare modules
- Fail-safe DI modules with safety-related signal processing according to PROFIsafe
- Option handling – for simplest management of machine options



#### SIMATIC ET 200S COMPACT

- Block I/O to degree of protection IP20 with 32 channels, comprising terminal block and electronic block
- Discretely modular expansion to maximum of 128 channels or 12 modules
- The complete ET 200S module spectrum can be used (with the exception of PROFIsafe modules)
- Separation of terminal connections and electronics with permanent wiring
- Screw-type and spring-loaded terminal connections
- Standard terminal block with 2-wire connection system; 3-wire and 4-wire systems available using additional terminals
- Mounting on standard rail
- Hot swapping of expansion modules
- Communication via PROFIBUS
- Up to 100 byte inputs and outputs (address space)

# SIMATIC ET 200 distributed I/O

## ET 200S

### Introduction

#### Technical specifications

##### General technical specifications

|                                                                          |                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Degree of protection                                                     | IP20                                                                                                                                                                                                                                                                                                                                                        |
| Ambient temperature                                                      | 0 ... 60 °C                                                                                                                                                                                                                                                                                                                                                 |
| Vibration resistance                                                     | 2 g permanently,<br>5 g temporarily<br>(motor starter max. 2 g)                                                                                                                                                                                                                                                                                             |
| Maximum configuration (none of the limits listed below must be exceeded) |                                                                                                                                                                                                                                                                                                                                                             |
| • Number of modules per IM 151, max.                                     | IM 151-1 BASIC:<br>Up to 12 modules<br>IM 151-1 COMPACT:<br>Up to 12 modules<br>IM 151-1 STANDARD:<br>Up to 63 modules<br>IM 151-1 HIGH-FEATURE:<br>Up to 63 modules<br>IM 151-7 CPU: Up to 63 modules<br>IM 151-3 PN: Up to 63 modules                                                                                                                     |
| • Line width, max.                                                       | IM 151-1 BASIC: Up to 2 m<br>IM 151-1 COMPACT: Up to 2 m<br>IM 151-1 STANDARD: Up to 2 m<br>IM 151-1 HIGH-FEATURE:<br>Up to 2 m<br>IM 151-7 CPU: Up to 1 m<br>IM 151-3 PN: Up to 2 m                                                                                                                                                                        |
| • User data length                                                       | Depending on the number and type of connected modules<br>IM 151-1 BASIC: Up to 88 byte for inputs and outputs<br>IM 151-1 COMPACT: Up to 100 byte for inputs and outputs<br>IM 151-1 STANDARD: Up to 244 byte for inputs and outputs<br>IM 151-1 HIGH-FEATURE: Up to 244 byte for inputs and outputs<br>IM 151-7 CPU: Not relevant<br>IM 151-3 PN: 256 byte |
| • Parameter length                                                       | Depending on the number and type of connected modules<br>IM 151-1 BASIC: 198 byte<br>IM 151-1 COMPACT: 218 byte<br>IM 151-1 STANDARD:<br>Up to 244 byte<br>IM 151-1 HIGH-FEATURE:<br>Up to 244 byte<br>IM 151-7 CPU: Not relevant<br>IM 151-3 PN: Not relevant                                                                                              |

##### General technical specifications

|                                                        |                                                                                                                                                                                                      |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Requirements of the DP master system                   |                                                                                                                                                                                                      |
| • PROFIBUS DP master                                   | In accordance with EN 50170                                                                                                                                                                          |
| • Parameter length                                     | >32 byte, depending on the number and type of connected modules                                                                                                                                      |
| • User data length                                     | Depending on the number and type of connected modules                                                                                                                                                |
| • diagnostic length                                    | 17 ... 64 byte (adjustable)                                                                                                                                                                          |
| <b>Standards and approvals</b>                         |                                                                                                                                                                                                      |
| • PROFIBUS                                             | EN 50170, Volume 2                                                                                                                                                                                   |
| • IEC 1131                                             | IEC 1131, Part 2                                                                                                                                                                                     |
| • UL                                                   | acc. to UL508 standard, File No. E 116536/E 75310 (AC modules)                                                                                                                                       |
| • C-Tick                                               | AS/NZS 2064 (Class A)                                                                                                                                                                                |
| • CSA                                                  | acc. to standard C22.2 No. 142, File No. LR 48323/LR 44226 (AC modules)                                                                                                                              |
| • cULus for hazardous locations                        | acc. to UL 508 standard, File No. E 116536<br>acc. to hazardous locations UL 1604, File no. E 222109<br>acc. to CSA C22.2 standard, No. 142                                                          |
| • FM                                                   | Standard Class No. 3611, Class I, Division 2, Group A, B, C, D, Class I, Zone 2, Group IIC (without motor starter and frequency converter)                                                           |
| • Shipbuilding                                         | American Bureau of Shipping<br>Bureau Veritas<br>Det Norske Veritas<br>Germanischer Lloyd<br>Lloyds Register of Shipping<br>Nippon Kaiji Kyokai<br>(without motor starters and frequency converters) |
| • Ex approval Cat. 3<br>(for Zone 2 acc. to ATEX-100a) | EN 50021<br>(without frequency converters)                                                                                                                                                           |

Within the context of converting SIMATIC from UL / CSA to cULus, the ET 200S modules will also be converted



## Overview



- Interface module for SIMATIC ET 200S with integrated S7-CPU 314
- For high-performance control solutions in ET 200S
- Increases the availability of plants and machinery
- Programming via PROFIBUS DP
- Compact SIMATIC Micro Memory Card (MMC)
- Integrated 12 Mbit/s PROFIBUS DP slave/MPI interface in copper design
- Integrated CPU based on CPU S7-314
- IM 151-7 CPU FO available
- Fail-safe IM 151-7 F CPU PROFIsafe available
- Also available as IM 151-8(F) PN/DP CPU with PROFINET interface

Note:  
Micro Memory Card required for operation of CPU.

## Technical specifications

|                                                | 6ES7 151-7AB00-0AB0                               | 6ES7 151-7AA20-0AB0                                                                           |
|------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Product version</b>                         |                                                   |                                                                                               |
| Associated programming package                 |                                                   | STEP 7 V5.2 + SP1 or higher with HW update                                                    |
| <b>Supply voltages</b>                         |                                                   |                                                                                               |
| Rated value                                    |                                                   |                                                                                               |
| • permissible range, lower limit (DC)          | 20.4 V                                            |                                                                                               |
| Load voltage L+                                |                                                   |                                                                                               |
| • Rated value (DC)                             |                                                   | 24 V                                                                                          |
| • Permissible range, lower limit (DC)          |                                                   | 20.4 V                                                                                        |
| • Permissible range, upper limit (DC)          |                                                   | 28.8 V                                                                                        |
| • Short-circuit protection                     |                                                   | Yes                                                                                           |
| • Reverse polarity protection                  |                                                   | Yes                                                                                           |
| <b>Current consumption</b>                     |                                                   |                                                                                               |
| Inrush current, max.                           | 3.5 A                                             |                                                                                               |
| Current output to backplane bus (5 V DC), max. |                                                   | 700 mA                                                                                        |
| from supply voltage 1L+, max.                  |                                                   | 250 mA; 280 mA with DP master module                                                          |
| <b>Power losses</b>                            |                                                   |                                                                                               |
| Power loss, typ.                               |                                                   | 3.3 W                                                                                         |
| <b>Memory</b>                                  |                                                   |                                                                                               |
| Work memory                                    |                                                   |                                                                                               |
| • integrated                                   | 48 Kibyte; as of FW V1.13 48 KB; previously 24 KB | 96 Kibyte; For program and data                                                               |
| • expandable                                   |                                                   | No                                                                                            |
| Load memory                                    |                                                   |                                                                                               |
| • pluggable (MMC)                              |                                                   | Yes                                                                                           |
| • pluggable (MMC), max.                        |                                                   | 8 Mbyte                                                                                       |
| <b>CPU-blocks</b>                              |                                                   |                                                                                               |
| Number of blocks (total)                       |                                                   | 1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. |
| DB                                             |                                                   |                                                                                               |
| • Number, max.                                 | 127                                               | 511; Number range: 1 to 511                                                                   |
| • Size, max.                                   |                                                   | 16 Kibyte                                                                                     |
| FB                                             |                                                   |                                                                                               |
| • Number, max.                                 | 128                                               | 1 024; Number range: 0 to 2047                                                                |
| • Size, max.                                   |                                                   | 16 Kibyte                                                                                     |
| FC                                             |                                                   |                                                                                               |
| • Number, max.                                 | 128                                               | 1 024; Number range: 0 to 2047                                                                |
| • Size, max.                                   |                                                   | 16 Kibyte                                                                                     |
| OB                                             |                                                   |                                                                                               |
| • Size, max.                                   |                                                   | 16 Kibyte                                                                                     |

## SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules with CPU  
IM 151-7 CPU

## Technical specifications (continued)

|                                                                      | 6ES7 151-7AB00-0AB0 | 6ES7 151-7AA20-0AB0                      |
|----------------------------------------------------------------------|---------------------|------------------------------------------|
| Nesting depth                                                        |                     |                                          |
| • per priority class                                                 | 8                   | 8                                        |
| • additional within an error OB                                      |                     | 4                                        |
| <b>CPU processing times</b>                                          |                     |                                          |
| for bit operations, min.                                             | 0.1 µs              | 0.1 µs                                   |
| for word operations, min.                                            | 1 µs                | 0.2 µs                                   |
| for fixed point arithmetic, min.                                     | 2 µs                | 2 µs                                     |
| for floating point arithmetic, min.                                  | 20 µs               | 3 µs                                     |
| <b>Counters, timers and their retentivity</b>                        |                     |                                          |
| S7 counter                                                           |                     |                                          |
| • Number                                                             | 256                 | 256                                      |
| • Retentivity                                                        |                     |                                          |
| - adjusted                                                           |                     | Yes                                      |
| - lower limit                                                        |                     | 0                                        |
| - upper limit                                                        |                     | 255                                      |
| - preset                                                             |                     | Z 0 to Z 7                               |
| • Counting range                                                     |                     |                                          |
| - adjusted                                                           | Yes                 | Yes                                      |
| - lower limit                                                        | 1                   | 0                                        |
| - upper limit                                                        | 999                 | 999                                      |
| IEC counter                                                          |                     |                                          |
| • Type                                                               |                     | SFB                                      |
| • Number                                                             |                     | Unlimited (limited only by RAM capacity) |
| S7 times                                                             |                     |                                          |
| • Number                                                             | 256                 | 256                                      |
| • Retentivity                                                        |                     |                                          |
| - adjusted                                                           |                     | Yes                                      |
| - lower limit                                                        |                     | 0                                        |
| - upper limit                                                        |                     | 255                                      |
| - preset                                                             |                     | No retentivity                           |
| • Time range                                                         |                     |                                          |
| - lower limit                                                        | 10 ms               | 10 ms                                    |
| - upper limit                                                        | 9 990 s             | 9 990 s                                  |
| IEC timer                                                            |                     |                                          |
| • Type                                                               |                     | SFB                                      |
| • Number                                                             |                     | Unlimited (limited only by RAM capacity) |
| <b>Data areas and their retentivity</b>                              |                     |                                          |
| Retentive data area in total<br>(incl. times, counters, flags), max. | 4 Kibyte            | 64 Kibyte                                |
| Flag                                                                 |                     |                                          |
| • Number, max.                                                       | 256 byte            | 256 byte                                 |
| • Retentivity available                                              |                     | Yes                                      |
| • Retentivity preset                                                 |                     | MB 0 to MB 15                            |
| • Number of clock memories                                           |                     | 8; 1 memory byte                         |
| Data blocks                                                          |                     |                                          |
| • Number, max.                                                       |                     | 511; Number range: 1 to 511              |
| • Size, max.                                                         |                     | 16 Kibyte                                |
| Local data                                                           |                     |                                          |
| • per priority class, max.                                           |                     | 510 byte                                 |
| <b>Address area</b>                                                  |                     |                                          |
| I/O address area                                                     |                     |                                          |
| • Overall                                                            |                     | 2 048 byte                               |
| • Outputs                                                            |                     | 2 048 byte                               |
| Process image                                                        |                     |                                          |
| • Inputs                                                             |                     | 128 byte; Not adjustable                 |
| • Outputs                                                            |                     | 128 byte; Not adjustable                 |



**Technical specifications** (continued)

|                                                      | 6ES7 151-7AB00-0AB0                                    | 6ES7 151-7AA20-0AB0                                                              |
|------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------|
| Digital channels                                     |                                                        |                                                                                  |
| • Inputs                                             |                                                        | 16 336                                                                           |
| • Outputs                                            |                                                        | 16 336                                                                           |
| • Inputs, of which central                           |                                                        | 248                                                                              |
| • Outputs, of which central                          |                                                        | 248                                                                              |
| Analog channels                                      |                                                        |                                                                                  |
| • Inputs                                             |                                                        | 1 021                                                                            |
| • Outputs                                            |                                                        | 1 021                                                                            |
| • Inputs, of which central                           |                                                        | 124                                                                              |
| • Outputs, of which central                          |                                                        | 124                                                                              |
| Addressing volume                                    |                                                        |                                                                                  |
| • Outputs                                            | 244 byte                                               |                                                                                  |
| • Inputs                                             | 244 byte                                               |                                                                                  |
| <b>Hardware configuration</b>                        |                                                        |                                                                                  |
| Number of modules per system, max.                   | 63                                                     | 63; Centralized                                                                  |
| Connectable programming devices/PCs                  | PGs/OPs with STEP 7 connectable via PROFIBUS interface |                                                                                  |
| <b>Time</b>                                          |                                                        |                                                                                  |
| Clock                                                |                                                        |                                                                                  |
| • Hardware clock (real-time clock)                   |                                                        | Yes                                                                              |
| • Battery-backed and synchronizable                  |                                                        | Yes                                                                              |
| • Backup time                                        |                                                        | 6 wk; At 40 °C ambient temperature, typically                                    |
| • Deviation per day, max.                            |                                                        | 10 s                                                                             |
| Runtime meter                                        |                                                        |                                                                                  |
| • Number                                             |                                                        | 1                                                                                |
| • Number/Number range                                |                                                        | 0                                                                                |
| • Range of values                                    |                                                        | 0 to 2 <sup>31</sup> hours (when using SFC 101)                                  |
| • Granularity                                        |                                                        | 1 hour                                                                           |
| • Retentive                                          |                                                        | Yes; Must be restarted at each restart                                           |
| Clock synchronization                                |                                                        |                                                                                  |
| • supported                                          |                                                        | Yes                                                                              |
| • to MPI, master                                     |                                                        | Yes                                                                              |
| • to MPI, slave                                      |                                                        | Yes                                                                              |
| • to DP, master                                      |                                                        | Yes                                                                              |
| • to DP, slave                                       |                                                        | Yes                                                                              |
| • in AS, master                                      |                                                        | No                                                                               |
| • in AS, slave                                       |                                                        | No                                                                               |
| <b>S7 message functions</b>                          |                                                        |                                                                                  |
| Number of login stations for message functions, max. |                                                        | 12; Depending on the configured connections for PG/OP and S7 basic communication |
| Process diagnostic messages                          |                                                        | Yes; ALARM_S, ALARM_SC, ALARM_SQ, ALARM_D, ALARM_DQ                              |
| Simultaneously active Alarm-S blocks, max.           |                                                        | 40                                                                               |
| <b>Test commissioning functions</b>                  |                                                        |                                                                                  |
| Status/control                                       |                                                        |                                                                                  |
| • Status/control variable                            |                                                        | Yes                                                                              |
| • Variables                                          |                                                        | Inputs, outputs, memory bits, DB, times, counters                                |
| • Number of variables, max.                          |                                                        | 30                                                                               |
| • of which status variables, max.                    |                                                        | 30                                                                               |
| • of which control variables, max.                   |                                                        | 14                                                                               |
| Forcing                                              |                                                        |                                                                                  |
| • Forcing                                            |                                                        | Yes                                                                              |
| Status block                                         |                                                        | Yes                                                                              |

## SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules with CPU  
IM 151-7 CPU

## Technical specifications (continued)

|                                                 | 6ES7 151-7AB00-0AB0 | 6ES7 151-7AA20-0AB0                                                                 |
|-------------------------------------------------|---------------------|-------------------------------------------------------------------------------------|
| Single step                                     |                     | Yes                                                                                 |
| Number of breakpoints                           |                     | 2                                                                                   |
| Diagnostic buffer                               |                     |                                                                                     |
| • Present                                       | Yes                 | Yes                                                                                 |
| • Number of entries, max.                       | 100                 | 100                                                                                 |
| - adjusted                                      |                     | No                                                                                  |
| <b>Communication functions</b>                  |                     |                                                                                     |
| PG/OP communication                             |                     | Yes                                                                                 |
| Global data communication                       |                     |                                                                                     |
| • Supported                                     |                     | Yes                                                                                 |
| • Number of GD packets, max.                    |                     | 4                                                                                   |
| • Number of GD packets, transmitter, max.       |                     | 4                                                                                   |
| • Number of GD packets, receiver, max.          |                     | 4                                                                                   |
| • Size of GD packets, max.                      |                     | 22 byte                                                                             |
| • Size of GD packet (of which consistent), max. |                     | 22 byte                                                                             |
| S7 basic communication                          |                     |                                                                                     |
| • Supported                                     |                     | Yes                                                                                 |
| • User data per job, max.                       |                     | 76 byte                                                                             |
| • User data per job (of which consistent), max. |                     | 76 byte; 76 byte (with X_SEND or X_RCV);<br>64 byte (with X_PUT or X_GET as server) |
| S7 communication                                |                     |                                                                                     |
| • supported                                     |                     | Yes                                                                                 |
| • as server                                     |                     | Yes                                                                                 |
| • as client                                     |                     | No                                                                                  |
| • User data per job, max.                       |                     | 180 byte                                                                            |
| • User data per job (of which consistent), max. |                     | 64 byte                                                                             |
| S5-compatible communication                     |                     |                                                                                     |
| • supported                                     |                     | No                                                                                  |
| Standard communication (FMS)                    |                     |                                                                                     |
| • supported                                     |                     | No                                                                                  |
| Number of connections                           |                     |                                                                                     |
| • overall                                       |                     | 12                                                                                  |
| • usable for PG communication                   |                     | 11                                                                                  |
| - reserved for PG communication                 |                     | 1                                                                                   |
| • usable for OP communication                   |                     | 11                                                                                  |
| - reserved for OP communication                 |                     | 1                                                                                   |
| • usable for S7 basic communication             |                     | 10                                                                                  |
| - Reserved for S7 basic communication           |                     | 0                                                                                   |
| • usable for routing                            |                     | 4; As slave only with active interface,<br>with IM 151-7 CPU as DP master           |
| <b>1st interface</b>                            |                     |                                                                                     |
| Type of interface                               |                     | Integrated RS 485 interface                                                         |
| Physics                                         |                     | RS 485                                                                              |
| Isolated                                        |                     | Yes                                                                                 |
| Power supply to interface (15 to 30 V DC), max. |                     | 80 mA                                                                               |
| Functionality                                   |                     |                                                                                     |
| • MPI                                           |                     | Yes                                                                                 |
| • DP master                                     |                     | No                                                                                  |
| • DP slave                                      | Yes                 | Yes; active / passive                                                               |
| • Point-to-point connection                     |                     | No                                                                                  |
| MPI                                             |                     |                                                                                     |
| • Number of connections                         |                     | 12; Notice: 12 connections per CPU,<br>not per interface                            |



## SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules with CPU  
IM 151-7 CPU

## Technical specifications (continued)

|                                                         | 6ES7 151-7AB00-0AB0                                                                                                                                                                                                                          | 6ES7 151-7AA20-0AB0                                                                                                                                                          |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Isochronous mode</b>                                 |                                                                                                                                                                                                                                              |                                                                                                                                                                              |
| Isochronous mode                                        |                                                                                                                                                                                                                                              | No                                                                                                                                                                           |
| <b>Programming</b>                                      |                                                                                                                                                                                                                                              |                                                                                                                                                                              |
| Configuration rules                                     |                                                                                                                                                                                                                                              | max. 63 I/O modules per station; station width < 1 m or < 2 m; max. 10 A per load group (power module); master interface module on right next to IM 151-7 CPU (X2 interface) |
| Programming language                                    |                                                                                                                                                                                                                                              |                                                                                                                                                                              |
| • STEP 7                                                |                                                                                                                                                                                                                                              | Yes                                                                                                                                                                          |
| • LAD                                                   |                                                                                                                                                                                                                                              | Yes                                                                                                                                                                          |
| • FBD                                                   |                                                                                                                                                                                                                                              | Yes                                                                                                                                                                          |
| • STL                                                   |                                                                                                                                                                                                                                              | Yes                                                                                                                                                                          |
| • SCL                                                   | Yes                                                                                                                                                                                                                                          | Yes; Optional                                                                                                                                                                |
| • GRAPH                                                 |                                                                                                                                                                                                                                              | Yes; Optional                                                                                                                                                                |
| Command set                                             | Binary logic operations, bracketed operations, result allocation, saving, counting, loading, transferring, comparing, shifting, rotating, complementation, calling blocks, fixed point arithmetic, floating point arithmetic, jump functions | See instruction list                                                                                                                                                         |
| Nesting levels                                          | 8                                                                                                                                                                                                                                            | 8                                                                                                                                                                            |
| Know-how protection                                     |                                                                                                                                                                                                                                              |                                                                                                                                                                              |
| • User program protection/password protection           | Yes                                                                                                                                                                                                                                          | Yes                                                                                                                                                                          |
| System functions (SFC)                                  | Interrupt and error processing, copy data, clock functions, diagnostic functions, module parameterization, operating mode transitions                                                                                                        | See instruction list                                                                                                                                                         |
| System function blocks (SFB)                            |                                                                                                                                                                                                                                              | See instruction list                                                                                                                                                         |
| <b>Isolation</b>                                        |                                                                                                                                                                                                                                              |                                                                                                                                                                              |
| Isolation checked with                                  |                                                                                                                                                                                                                                              | 500 V DC                                                                                                                                                                     |
| <b>Galvanic isolation</b>                               |                                                                                                                                                                                                                                              |                                                                                                                                                                              |
| between load voltage and all other switching components |                                                                                                                                                                                                                                              | Yes                                                                                                                                                                          |
| between PROFIBUS DP and all other circuit components    |                                                                                                                                                                                                                                              | Yes                                                                                                                                                                          |
| <b>Permissible potential difference</b>                 |                                                                                                                                                                                                                                              |                                                                                                                                                                              |
| between different circuits                              |                                                                                                                                                                                                                                              | 75 V DC / 60 V AC                                                                                                                                                            |
| <b>Environmental requirements</b>                       |                                                                                                                                                                                                                                              |                                                                                                                                                                              |
| Operating temperature                                   |                                                                                                                                                                                                                                              |                                                                                                                                                                              |
| • Min.                                                  | 0 °C                                                                                                                                                                                                                                         |                                                                                                                                                                              |
| <b>Dimensions and weight</b>                            |                                                                                                                                                                                                                                              |                                                                                                                                                                              |
| Dimensions                                              |                                                                                                                                                                                                                                              |                                                                                                                                                                              |
| • Width                                                 | 60 mm                                                                                                                                                                                                                                        | 60 mm; DP master module: 35 mm                                                                                                                                               |
| • Height                                                | 119.5 mm                                                                                                                                                                                                                                     | 119.5 mm                                                                                                                                                                     |
| • Depth                                                 | 75 mm                                                                                                                                                                                                                                        | 75 mm                                                                                                                                                                        |
| Weight                                                  |                                                                                                                                                                                                                                              |                                                                                                                                                                              |
| • Weight, approx.                                       | 200 g                                                                                                                                                                                                                                        | 200 g; DP master module: Approx. 100 g                                                                                                                                       |

| Ordering data                                                                  | Order No.                  |                                                                                                                                                                                                | Order No.                                                                                                            |
|--------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>IM 151-7 CPU FO interface module (48 K)</b><br>Including termination module | <b>6ES7 151-7AB00-0AB0</b> | <b>Label sheets DIN A4 (10 units)</b><br>Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules<br>• petrol<br>• red<br>• yellow<br>• light beige | <b>6ES7 193-4BH00-0AA0</b><br><b>6ES7 193-4BD00-0AA0</b><br><b>6ES7 193-4BB00-0AA0</b><br><b>6ES7 193-4BA00-0AA0</b> |
| <b>IM 151-7 CPU interface module (96 K)</b><br>Including termination module    | <b>6ES7 151-7AA20-0AB0</b> | <b>ET 200S distributed I/O system manuals</b><br>are available on the Internet as PDF files:<br><a href="http://www.siemens.com/simatic-docu">www.siemens.com/simatic-docu</a>                 |                                                                                                                      |
| <b>Accessories</b>                                                             |                            | <b>Termination module</b><br>as spare part for ET 200S                                                                                                                                         | <b>6ES7 193-4JA00-0AA0</b>                                                                                           |
| <b>MMC 64 KB <sup>1)</sup></b><br>for program backup                           | <b>6ES7 953-8LF20-0AA0</b> | <b>SIMATIC S5, 35 mm DIN rail</b><br>• Length: 483 mm for 19" cabinets<br>• Length: 530 mm for 600 mm cabinets<br>• Length: 830 mm for 900 mm cabinets<br>• 2 m long                           | <b>6ES5 710-8MA11</b><br><b>6ES5 710-8MA21</b><br><br><b>6ES5 710-8MA31</b><br><br><b>6ES5 710-8MA41</b>             |
| <b>MMC 128 KB <sup>1)</sup></b><br>for program backup                          | <b>6ES7 953-8LG20-0AA0</b> |                                                                                                                                                                                                |                                                                                                                      |
| <b>MMC 512 KB <sup>1)</sup></b><br>for program backup                          | <b>6ES7 953-8LJ20-0AA0</b> |                                                                                                                                                                                                |                                                                                                                      |
| <b>MMC 2 MB <sup>1)</sup></b><br>for program backup and/or firmware update     | <b>6ES7 953-8LL20-0AA0</b> |                                                                                                                                                                                                |                                                                                                                      |
| <b>MMC 4 MB <sup>1)</sup></b><br>for program backup                            | <b>6ES7 953-8LM20-0AA0</b> |                                                                                                                                                                                                |                                                                                                                      |
| <b>MMC 8 MB <sup>1)</sup></b><br>for program backup                            | <b>6ES7 953-8LP20-0AA0</b> |                                                                                                                                                                                                |                                                                                                                      |
| <b>External prommer</b><br>e.g. for MMC with USB interface                     | <b>6ES7 792-0AA00-0XA0</b> |                                                                                                                                                                                                |                                                                                                                      |
| <b>PG</b><br>with integrated MMC interface                                     | On request                 |                                                                                                                                                                                                |                                                                                                                      |

<sup>1)</sup> An MMC is essential for operating the CPU

# SIMATIC ET 200 distributed I/O

## ET 200S

### Interface modules with CPU IM 151-8 PN/DP CPU

#### Overview



- Interface module for SIMATIC ET 200S with integrated CPU S7-314
- For high-performance control solutions in ET 200S
- Increase of the availability of systems and machines
- PROFINET IO controller for up to 128 IO devices

- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With many communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7-communication (with loadable FBs)
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)
- Optional PROFIBUS master for 32 PROFIBUS DP slaves (with master interface 6ES7138-4HA00-0AB0)
- Fail-safe IM 151-8F PN/DP CPU PROFIsafe available

Note:

SIMATIC Micro Memory Card required for operation of CPU.

#### Technical specifications

|                                                        | 6ES7 151-8AB00-0AB0                                                                                                                                                                                                                                                                                     | 6ES7 151-8AB01-0AB0                                                                                                                                                                                                                                           |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product version</b>                                 |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                               |
| Associated programming package                         | STEP7 V5.4 SP4 or higher                                                                                                                                                                                                                                                                                | STEP7 V 5.5 or higher                                                                                                                                                                                                                                         |
| <b>Supply voltages</b>                                 |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                               |
| Rated value                                            | 20.4 V                                                                                                                                                                                                                                                                                                  | 20.4 V                                                                                                                                                                                                                                                        |
| • permissible range, lower limit (DC)                  |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                               |
| External protection for supply cables (recommendation) | 24 V DC/16 A miniature circuit breaker with type B and C tripping characteristics. Note: The 24 V DC/16 A miniature circuit breaker with type B tripping characteristics trips before the device protection fuse. The 24 V DC/16 A miniature circuit breaker with type C tripping characteristics trips | 24 V DC/16 A miniature circuit breaker with type B and C tripping characteristics. Note: A 24 V DC/16 A miniature circuit breaker with type B tripping characteristics trips before and with type C tripping characteristic after the device protection fuse. |
| <b>Mains buffering</b>                                 |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                               |
| • Mains/voltage failure stored energy time             | 5 ms                                                                                                                                                                                                                                                                                                    | 5 ms                                                                                                                                                                                                                                                          |
| <b>Current consumption</b>                             |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                               |
| Inrush current, max.                                   | 1.8 A; typ.                                                                                                                                                                                                                                                                                             | 1.8 A; typ.                                                                                                                                                                                                                                                   |
| $I^2t$                                                 | 0.21 A <sup>2</sup> ·s                                                                                                                                                                                                                                                                                  | 0.13 A <sup>2</sup> ·s                                                                                                                                                                                                                                        |
| Current output to backplane bus (5 V DC), max.         | 700 mA                                                                                                                                                                                                                                                                                                  | 700 mA                                                                                                                                                                                                                                                        |
| from supply voltage 1L+, max.                          | 380 mA; 460 mA with DP master module                                                                                                                                                                                                                                                                    | 352 mA; 426 mA with DP master module                                                                                                                                                                                                                          |
| <b>Power losses</b>                                    |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                               |
| Power loss, typ.                                       | 5.5 W                                                                                                                                                                                                                                                                                                   | 5.5 W                                                                                                                                                                                                                                                         |
| <b>Memory</b>                                          |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                               |
| Work memory                                            |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                               |
| • integrated                                           | 128 Kibyte; For program and data                                                                                                                                                                                                                                                                        | 192 Kibyte; For program and data                                                                                                                                                                                                                              |
| • expandable                                           | No                                                                                                                                                                                                                                                                                                      | No                                                                                                                                                                                                                                                            |
| • size of retentive memory for retentive data blocks   | 64 kbyte                                                                                                                                                                                                                                                                                                | 64 kbyte                                                                                                                                                                                                                                                      |
| Load memory                                            |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                               |
| • pluggable (MMC)                                      | Yes                                                                                                                                                                                                                                                                                                     | Yes                                                                                                                                                                                                                                                           |
| • pluggable (MMC), max.                                | 8 Mbyte                                                                                                                                                                                                                                                                                                 | 8 Mbyte                                                                                                                                                                                                                                                       |

**Technical specifications** (continued)

|                                               | 6ES7 151-8AB00-0AB0                                                                           | 6ES7 151-8AB01-0AB0                                                                           |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>CPU-blocks</b>                             |                                                                                               |                                                                                               |
| Number of blocks (total)                      | 1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. | 1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. |
| DB                                            |                                                                                               |                                                                                               |
| • Number, max.                                | 511; Number range: 1 to 511                                                                   | 1 024; Number range: 1 to 16,000                                                              |
| • Size, max.                                  | 64 Kibyte                                                                                     | 64 Kibyte                                                                                     |
| FB                                            |                                                                                               |                                                                                               |
| • Number, max.                                | 1 024; Number range: 0 to 2047                                                                | 1 024; Number range: 0 to 7,999                                                               |
| • Size, max.                                  | 64 Kibyte                                                                                     | 64 Kibyte                                                                                     |
| FC                                            |                                                                                               |                                                                                               |
| • Number, max.                                | 1 024; Number range: 0 to 2047                                                                | 1 024; Number range: 0 to 7,999                                                               |
| • Size, max.                                  | 64 Kibyte                                                                                     | 64 Kibyte                                                                                     |
| OB                                            |                                                                                               |                                                                                               |
| • Size, max.                                  | 64 Kibyte                                                                                     | 64 Kibyte                                                                                     |
| Nesting depth                                 |                                                                                               |                                                                                               |
| • per priority class                          | 16                                                                                            | 16                                                                                            |
| • additional within an error OB               | 4                                                                                             | 4                                                                                             |
| <b>CPU processing times</b>                   |                                                                                               |                                                                                               |
| for bit operations, min.                      | 0.1 µs                                                                                        | 0.06 µs                                                                                       |
| for word operations, min.                     | 0.2 µs                                                                                        | 0.12 µs                                                                                       |
| for fixed point arithmetic, min.              | 2 µs                                                                                          | 0.16 µs                                                                                       |
| for floating point arithmetic, min.           | 3 µs                                                                                          | 0.59 µs                                                                                       |
| <b>Counters, timers and their retentivity</b> |                                                                                               |                                                                                               |
| S7 counter                                    |                                                                                               |                                                                                               |
| • Number                                      | 256                                                                                           | 256                                                                                           |
| • Retentivity                                 |                                                                                               |                                                                                               |
| - adjusted                                    | Yes                                                                                           | Yes                                                                                           |
| - lower limit                                 | 0                                                                                             | 0                                                                                             |
| - upper limit                                 | 255                                                                                           | 255                                                                                           |
| - preset                                      | Z 0 to Z 7                                                                                    | Z 0 to Z 7                                                                                    |
| • Counting range                              |                                                                                               |                                                                                               |
| - adjusted                                    | Yes                                                                                           | Yes                                                                                           |
| - lower limit                                 | 0                                                                                             | 0                                                                                             |
| - upper limit                                 | 999                                                                                           | 999                                                                                           |
| IEC counter                                   |                                                                                               |                                                                                               |
| • Type                                        | SFB                                                                                           | SFB                                                                                           |
| • Number                                      | Unlimited (limited only by RAM capacity)                                                      | Unlimited (limited only by RAM capacity)                                                      |
| S7 times                                      |                                                                                               |                                                                                               |
| • Number                                      | 256                                                                                           | 256                                                                                           |
| • Retentivity                                 |                                                                                               |                                                                                               |
| - adjusted                                    | Yes                                                                                           | Yes                                                                                           |
| - lower limit                                 | 0                                                                                             | 0                                                                                             |
| - upper limit                                 | 255                                                                                           | 255                                                                                           |
| - preset                                      | No retentivity                                                                                | No retentivity                                                                                |
| • Time range                                  |                                                                                               |                                                                                               |
| - lower limit                                 | 10 ms                                                                                         | 10 ms                                                                                         |
| - upper limit                                 | 9 990 s                                                                                       | 9 990 s                                                                                       |
| IEC timer                                     |                                                                                               |                                                                                               |
| • Type                                        | SFB                                                                                           | SFB                                                                                           |
| • Number                                      | Unlimited (limited only by RAM capacity)                                                      | Unlimited (limited only by RAM capacity)                                                      |



## SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules with CPU  
IM 151-8 PN/DP CPU

## Technical specifications (continued)

|                                                           | 6ES7 151-8AB00-0AB0                                                      | 6ES7 151-8AB01-0AB0                                                      |
|-----------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------|
| <b>Data areas and their retentivity</b>                   |                                                                          |                                                                          |
| Flag                                                      |                                                                          |                                                                          |
| • Number, max.                                            | 256 byte                                                                 | 256 byte                                                                 |
| • Retentivity available                                   | Yes                                                                      | Yes                                                                      |
| • Retentivity preset                                      | MB 0 to MB 15                                                            | MB 0 to MB 15                                                            |
| • Number of clock memories                                | 8; 1 memory byte                                                         | 8; 1 memory byte                                                         |
| Data blocks                                               |                                                                          |                                                                          |
| • Number, max.                                            | 511; Number range: 1 to 511                                              | 1 024; Number range: 1 to 16,000                                         |
| • Size, max.                                              | 64 Kibyte                                                                | 64 Kibyte                                                                |
| • Retentivity adjustable                                  | Yes; via non-retain property on DB                                       | Yes; via non-retain property on DB                                       |
| • Retentivity preset                                      | Yes                                                                      | Yes                                                                      |
| Local data                                                |                                                                          |                                                                          |
| • per priority class, max.                                | 510 byte; per priority class                                             | 32 768 byte; 2048 byte max. per block                                    |
| <b>Address area</b>                                       |                                                                          |                                                                          |
| I/O address area                                          |                                                                          |                                                                          |
| • Overall                                                 | 2 048 byte                                                               | 2 048 byte                                                               |
| • Outputs                                                 | 2 048 byte                                                               | 2 048 byte                                                               |
| • of which, distributed                                   |                                                                          |                                                                          |
| - Inputs                                                  | 2 048 byte                                                               | 2 048 byte                                                               |
| - Outputs                                                 | 2 048 byte                                                               | 2 048 byte                                                               |
| Process image                                             |                                                                          |                                                                          |
| • Inputs, adjustable                                      | 2 048 byte                                                               | 2 048 byte                                                               |
| • Outputs, adjustable                                     | 2 048 byte                                                               | 2 048 byte                                                               |
| • Inputs, preset                                          | 128 byte                                                                 | 128 byte                                                                 |
| • Outputs, preset                                         | 128 byte                                                                 | 128 byte                                                                 |
| Subprocess images                                         |                                                                          |                                                                          |
| • Number of subprocess images, max.                       | None                                                                     | 1; With PROFINET IO, the length of the user data is limited to 1600 byte |
| Digital channels                                          |                                                                          |                                                                          |
| • Inputs                                                  | 16 336                                                                   | 16 336                                                                   |
| • Outputs                                                 | 16 336                                                                   | 16 336                                                                   |
| • Inputs, of which central                                | 496                                                                      | 496                                                                      |
| • Outputs, of which central                               | 496                                                                      | 496                                                                      |
| Analog channels                                           |                                                                          |                                                                          |
| • Inputs                                                  | 1 021                                                                    | 1 021                                                                    |
| • Outputs                                                 | 1 021                                                                    | 1 021                                                                    |
| • Inputs, of which central                                | 124                                                                      | 124                                                                      |
| • Outputs, of which central                               | 124                                                                      | 124                                                                      |
| <b>Hardware configuration</b>                             |                                                                          |                                                                          |
| Number of mounting rails that can be used                 | 1                                                                        | 1                                                                        |
| Max. length of mounting rail                              | Station width: ≤ 1 m or < 2 m                                            | Station width: ≤ 1 m or < 2 m                                            |
| Number of modules per system, max.                        | 63; Centralized                                                          | 63; Centralized                                                          |
| <b>Time</b>                                               |                                                                          |                                                                          |
| Clock                                                     |                                                                          |                                                                          |
| • Hardware clock (real-time clock)                        | Yes                                                                      | Yes                                                                      |
| • Battery-backed and synchronizable                       | Yes                                                                      | Yes                                                                      |
| • Backup time                                             | 6 wk; At 40 °C ambient temperature, typically                            | 6 wk; At 40 °C ambient temperature, typically                            |
| • Behavior of the clock following POWER-ON                |                                                                          | Clock continues running after POWER OFF                                  |
| • Behavior of the clock following expiry of backup period | Clock continues to run with the time at which the power failure occurred | Clock continues to run with the time at which the power failure occurred |
| • Deviation per day, max.                                 | 10 s                                                                     | 10 s; Typ.: 2 s                                                          |

**Technical specifications (continued)**

|                                                      | 6ES7 151-8AB00-0AB0                                                              | 6ES7 151-8AB01-0AB0                                                              |
|------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Runtime meter                                        |                                                                                  |                                                                                  |
| • Number                                             | 1                                                                                | 1                                                                                |
| • Number/Number range                                | 0                                                                                | 0                                                                                |
| • Range of values                                    | 0 to 2 <sup>31</sup> hours (when using SFC 101)                                  | 0 to 2 <sup>31</sup> hours (when using SFC 101)                                  |
| • Granularity                                        | 1 hour                                                                           | 1 hour                                                                           |
| • Retentive                                          | Yes; must be restarted at each restart                                           | Yes; must be restarted at each restart                                           |
| Clock synchronization                                |                                                                                  |                                                                                  |
| • supported                                          | Yes                                                                              | Yes                                                                              |
| • to MPI, master                                     | No                                                                               | No                                                                               |
| • to MPI, slave                                      | No                                                                               | No                                                                               |
| • to DP, master                                      | Yes; with DP master module                                                       | Yes; with DP master module                                                       |
| • to DP, slave                                       | Yes; with DP master module                                                       | Yes; with DP master module                                                       |
| • in AS, master                                      | No                                                                               | No                                                                               |
| • in AS, slave                                       | No                                                                               | No                                                                               |
| • on Ethernet via NTP                                | Yes; as client                                                                   | Yes; as client                                                                   |
| <b>S7 message functions</b>                          |                                                                                  |                                                                                  |
| Number of login stations for message functions, max. | 12; depending on the configured connections for PG/OP and S7 basic communication | 12; depending on the configured connections for PG/OP and S7 basic communication |
| Process diagnostic messages                          | Yes; ALARM_S, ALARM_SC, ALARM_SQ, ALARM_D, ALARM_DQ                              | Yes; ALARM_S, ALARM_SC, ALARM_SQ, ALARM_D, ALARM_DQ                              |
| Simultaneously active Alarm-S blocks, max.           | 300                                                                              | 300                                                                              |
| <b>Test commissioning functions</b>                  |                                                                                  |                                                                                  |
| Status/control                                       |                                                                                  |                                                                                  |
| • Status/control variable                            | Yes                                                                              | Yes                                                                              |
| • Variables                                          | Inputs, outputs, memory bits, DB, times, counters                                | Inputs, outputs, memory bits, DB, times, counters                                |
| • Number of variables, max.                          | 30                                                                               | 30                                                                               |
| • of which status variables, max.                    | 30                                                                               | 30                                                                               |
| • of which control variables, max.                   | 14                                                                               | 14                                                                               |
| Forcing                                              |                                                                                  |                                                                                  |
| • Forcing                                            | Yes                                                                              | Yes                                                                              |
| Status block                                         | Yes                                                                              | Yes; up to 2 simultaneously                                                      |
| Single step                                          | Yes                                                                              | Yes                                                                              |
| Number of breakpoints                                | 2                                                                                | 4                                                                                |
| Diagnostic buffer                                    |                                                                                  |                                                                                  |
| • Present                                            | Yes                                                                              | Yes                                                                              |
| • Number of entries, max.                            | 500                                                                              | 500                                                                              |
| - adjusted                                           | No                                                                               | No                                                                               |
| - Of which powerfail-proof                           | 100; only the last 100 entries are retained                                      | 100; only the last 100 entries are retained                                      |
| <b>Monitoring functions</b>                          |                                                                                  |                                                                                  |
| Status LEDs                                          |                                                                                  | Yes                                                                              |
| <b>Communication functions</b>                       |                                                                                  |                                                                                  |
| PG/OP communication                                  | Yes                                                                              | Yes                                                                              |
| Data record routing                                  | Yes; with DP master module                                                       | Yes; with DP master module                                                       |
| Routing                                              | Yes; with DP master module                                                       | Yes; with DP master module                                                       |
| Global data communication                            |                                                                                  |                                                                                  |
| • supported                                          | No                                                                               | No                                                                               |
| S7 basic communication                               |                                                                                  |                                                                                  |
| • Supported                                          | Yes; I blocks                                                                    | Yes; I blocks                                                                    |
| • User data per job, max.                            | 76 byte                                                                          | 76 byte                                                                          |
| • User data per job (of which consistent), max.      | 76 byte                                                                          | 76 byte                                                                          |

## SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules with CPU  
IM 151-8 PN/DP CPU

## Technical specifications (continued)

|                                                              | 6ES7 151-8AB00-0AB0                                     | 6ES7 151-8AB01-0AB0                                                                                      |
|--------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| S7 communication                                             |                                                         |                                                                                                          |
| • Supported                                                  | Yes                                                     | Yes                                                                                                      |
| • as server                                                  | Yes                                                     | Yes                                                                                                      |
| • as client                                                  | Yes; via integrated PN interface and loadable FBs       | Yes; via integrated PN interface and loadable FBs                                                        |
| • User data per job, max.                                    | 180 byte                                                | See online help of STEP 7<br>(shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication) |
| • User data per job (of which consistent), max.              | 64 byte                                                 |                                                                                                          |
| S5-compatible communication                                  |                                                         |                                                                                                          |
| • supported                                                  | No                                                      |                                                                                                          |
| Standard communication (FMS)                                 |                                                         |                                                                                                          |
| • supported                                                  | No                                                      |                                                                                                          |
| Web server                                                   |                                                         |                                                                                                          |
| • Supported                                                  | Yes                                                     | Yes                                                                                                      |
| • Number of HTTP clients                                     | 5                                                       | 5                                                                                                        |
| • User-defined websites                                      |                                                         | Yes                                                                                                      |
| Open IE communication                                        |                                                         |                                                                                                          |
| • TCP/IP                                                     | Yes; via integrated PROFINET interface and loadable FBs | Yes; via integrated PROFINET interface and loadable FBs                                                  |
| - Number of connections, max.                                | 8                                                       | 8                                                                                                        |
| - Data length for connection type 01H, max.                  | 1 460 byte                                              | 1 460 byte                                                                                               |
| - Data length for connection type 11H, max.                  | 8 192 byte                                              | 32 768 byte                                                                                              |
| - Several passive connections per port, supported            |                                                         | Yes                                                                                                      |
| • ISO-on-TCP (RFC1006)                                       | Yes; via integrated PROFINET interface and loadable FBs | Yes; via integrated PROFINET interface and loadable FBs                                                  |
| - Number of connections, max.                                | 8                                                       | 8                                                                                                        |
| - Data length, max.                                          | 8 192 byte                                              | 32 768 byte                                                                                              |
| • UDP                                                        | Yes; via integrated PROFINET interface and loadable FBs | Yes; via integrated PROFINET interface and loadable FBs                                                  |
| - Number of connections, max.                                | 8                                                       | 8                                                                                                        |
| - Data length, max.                                          | 1 472 byte                                              | 1 472 byte                                                                                               |
| Number of connections                                        |                                                         |                                                                                                          |
| • overall                                                    | 12                                                      | 12                                                                                                       |
| • usable for PG communication                                | 11                                                      | 11                                                                                                       |
| - reserved for PG communication                              | 1                                                       | 1                                                                                                        |
| - adjustable for PG communication, min.                      | 1                                                       | 1                                                                                                        |
| • usable for OP communication                                | 11                                                      | 11                                                                                                       |
| - reserved for OP communication                              | 1                                                       | 1                                                                                                        |
| - adjustable for OP communication, min.                      | 1                                                       | 1                                                                                                        |
| • usable for S7 basic communication                          | 10                                                      | 10                                                                                                       |
| - reserved for S7 basic communication                        | 0                                                       | 0                                                                                                        |
| - adjustable for S7 basic communication, min.                | 0                                                       | 0                                                                                                        |
| • usable for S7 communication                                | 10; with loadable FBs                                   | 10; with loadable FBs                                                                                    |
| - adjustable for S7 communication, max.                      | 10                                                      | 10                                                                                                       |
| • max. total number of instances                             | 32                                                      | 32                                                                                                       |
| • usable for routing                                         | 4; with DP master module                                | 4; with DP master module                                                                                 |
| PROFINET CBA<br>(at set setpoint communication load)         |                                                         |                                                                                                          |
| • Setpoint for the CPU communication load                    | 50 %                                                    | 50 %                                                                                                     |
| • Number of remote interconnection partners                  | 32                                                      | 32                                                                                                       |
| • Number of functions, master/slave                          | 30                                                      | 30                                                                                                       |
| • Total of all master/slave connections                      | 1 000                                                   | 1 000                                                                                                    |
| • Data length of all incoming connections master/slave, max. | 4 000 byte                                              | 4 000 byte                                                                                               |

## Technical specifications (continued)

|                                                                      | 6ES7 151-8AB00-0AB0       | 6ES7 151-8AB01-0AB0       |
|----------------------------------------------------------------------|---------------------------|---------------------------|
| PROFINET CBA<br>(at set setpoint communication load)                 |                           |                           |
| • Data length of all outgoing connections master/slave, max.         | 4 000 byte                | 4 000 byte                |
| • Number of device-internal and PROFIBUS interconnections            | 500                       | 500                       |
| • Data length of device-internal und PROFIBUS interconnections, max. | 4 000 byte                | 4 000 byte                |
| • Data length per connection, max.                                   | 1 400 byte                | 1 400 byte                |
| • Remote interconnections with acyclic transmission                  |                           |                           |
| - Sampling frequency: Sampling time, min.                            | 500 ms                    | 500 ms                    |
| - Number of incoming interconnections                                | 100                       | 100                       |
| - Number of outgoing interconnections                                | 100                       | 100                       |
| - Data length of all incoming interconnections, max.                 | 2 000 byte                | 2 000 byte                |
| - Data length of all outgoing interconnections, max.                 | 2 000 byte                | 2 000 byte                |
| - Data length per connection, max.                                   | 1 400 byte                | 1 400 byte                |
| • Remote interconnections with cyclic transmission                   |                           |                           |
| - Transmission frequency: Transmission interval, min.                | 1 ms                      | 1 ms                      |
| - Number of incoming interconnections                                | 200                       | 200                       |
| - Number of outgoing interconnections                                | 200                       | 200                       |
| - Data length of all incoming interconnections, max.                 | 2 000 byte                | 2 000 byte                |
| - Data length of all outgoing interconnections, max.                 | 2 000 byte                | 2 000 byte                |
| - Data length per connection, max.                                   | 250 byte                  | 450 byte                  |
| • HMI variables via PROFINET (acyclic)                               |                           |                           |
| - Number of stations that can log on for HMI variables (PN OPC/iMap) | 3; 2x PN OPC/1x iMap      | 3; 2x PN OPC/1x iMap      |
| - HMI variable updating                                              | 500 ms                    | 500 ms                    |
| - Number of HMI variables                                            | 200                       | 200                       |
| - Data length of all HMI variables, max.                             | 2 000 byte                | 2 000 byte                |
| • PROFIBUS proxy functionality                                       |                           |                           |
| - supported                                                          | Yes                       | Yes                       |
| - Number of linked PROFIBUS devices                                  | 16                        | 16                        |
| - Data length per connection, max.                                   | 240 byte; slave-dependent | 240 byte; slave-dependent |
| <b>1st interface</b>                                                 |                           |                           |
| Type of interface                                                    | PROFINET                  | PROFINET                  |
| Physics                                                              | Ethernet                  | Ethernet                  |
| Isolated                                                             | Yes                       | Yes                       |
| Integrated switch                                                    | Yes                       | Yes                       |
| Number of ports                                                      | 3; RJ45                   | 3; RJ45                   |
| Automatic detection of transmission speed                            | Yes                       | Yes                       |
| Autonegotiation                                                      | Yes                       | Yes                       |
| Autocrossing                                                         | Yes                       | Yes                       |
| Media redundancy                                                     |                           |                           |
| • Supported                                                          |                           | Yes                       |
| • Switchover time on line break, typically                           |                           | 200 ms; PROFINET MRP      |
| • Number of stations in the ring, max.                               |                           | 50                        |
| Change of IP address at runtime, supported                           |                           | Yes                       |

## SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules with CPU  
IM 151-8 PN/DP CPU

## Technical specifications (continued)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6ES7 151-8AB00-0AB0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6ES7 151-8AB01-0AB0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Functionality <ul style="list-style-type: none"> <li>• MPI</li> <li>• DP master</li> <li>• DP slave</li> <li>• PROFINET IO device</li> <li>• PROFINET IO controller</li> <li>• PROFINET CBA</li> <li>• Open IE communication</li> <li>• Web server               <ul style="list-style-type: none"> <li>- Number of HTTP clients</li> </ul> </li> <li>• Point-to-point connection</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | No<br>No<br>No<br>No<br>Yes<br><br>Yes<br>Yes<br>Yes<br>5<br>No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | No<br>No<br>No<br>Yes; Also simultaneously with IO controller functionality<br>Yes; also simultaneously with IO device functionality<br>Yes<br>Yes<br>Yes<br>5<br>No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| PROFINET IO controller <ul style="list-style-type: none"> <li>• Services               <ul style="list-style-type: none"> <li>- PG/OP communication</li> <li>- Routing</li> <li>- S7 communication</li> <li>- Isochronous mode</li> <li>- Open IE communication</li> </ul> </li> <li>• Transmission rate, max.</li> <li>• Number of connectable IO devices, max.</li> <li>• Max. number of connectable IO devices for RT               <ul style="list-style-type: none"> <li>- of which in line, max.</li> </ul> </li> <li>• Number of IO devices with IRT and the option "high flexibility"               <ul style="list-style-type: none"> <li>- of which in line, max.</li> </ul> </li> <li>• Number of IO devices with IRT and the option "high performance", max.               <ul style="list-style-type: none"> <li>- of which in line, max.</li> </ul> </li> <li>• IRT, supported               <ul style="list-style-type: none"> <li>- Shared device, supported</li> </ul> </li> <li>• Prioritized startup supported               <ul style="list-style-type: none"> <li>- Number of IO devices, max.</li> </ul> </li> <li>• Activation/deactivation of IO devices               <ul style="list-style-type: none"> <li>- Number of IO devices that can be simultaneously activated/deactivated, max.</li> </ul> </li> <li>• IO devices changing during operation (partner ports), supported               <ul style="list-style-type: none"> <li>- Max. number of IO devices per tool</li> </ul> </li> <li>• Device replacement without swap medium</li> <li>• Send cycles</li> <li>• Updating time</li> <li>• Updating times</li> <li>• Address area               <ul style="list-style-type: none"> <li>- Inputs, max.</li> <li>- Outputs, max.</li> </ul> </li> <li>• User data per address area, max.               <ul style="list-style-type: none"> <li>- User data consistency, max.</li> </ul> </li> </ul> | Yes<br>Yes; with DP master module<br>Yes; with loadable FBs<br>No<br>Yes; Via TCP/IP, ISO on TCP, and UDP<br>100 Mbit/s; full duplex<br>128<br>128<br>128<br>128<br>61<br><br>Yes<br>Yes<br>32<br>Yes<br>8<br>Yes<br>8<br>Yes<br>Adjustable: 250 µs, 500 µs and 1 ms<br><br>Minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the number of configured user data units.<br>250 µs - 128 ms (at signal cycle 250 µs);<br>500 µs - 256 ms (at signal cycle 500 µs);<br>1 ms - 512 ms (at signal cycle 1 ms)<br><br>2 kbyte<br>2 kbyte<br>254 byte; with PROFINET I/O | Yes<br>Yes; with DP master module<br>Yes; with loadable FBs<br>Yes; OB 61; only for PROFINET IO<br>Yes; Via TCP/IP, ISO on TCP, and UDP<br>100 Mbit/s; full duplex<br>128<br>128<br>128<br>128<br>61<br>64<br><br>64<br>Yes<br>Yes<br>32<br>Yes<br>8<br>Yes<br>8<br>Yes<br>250 µs, 500 µs, 1 ms; 2 ms, 4 ms (not in the case of IRT with "high flexibility" option)<br>Minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the number of configured user data units.<br>250 µs to 512 ms (depends on operating mode; for more details, refer to Operating Instructions, "Interface Module IM151-8 PN/DP CPU")<br><br>2 kbyte<br>2 kbyte<br>1 024 byte; with PROFINET I/O |
| PROFINET IO device <ul style="list-style-type: none"> <li>• Services               <ul style="list-style-type: none"> <li>- PG/OP communication</li> <li>- Routing</li> <li>- S7 communication</li> <li>- Isochronous mode</li> <li>- Open IE communication</li> <li>- IRT, supported</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Yes<br>Yes<br>Yes; With loadable FBs<br>No<br>Yes; Via TCP/IP, ISO on TCP, UDP<br>Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## Technical specifications (continued)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 6ES7 151-8AB00-0AB0                                                                                                                                                          | 6ES7 151-8AB01-0AB0                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PROFINET IO device <ul style="list-style-type: none"> <li>Services               <ul style="list-style-type: none"> <li>PROFenergy, supported</li> <li>Shared device, supported</li> <li>Number of IO controllers with shared device, max.</li> </ul> </li> <li>Transfer memory               <ul style="list-style-type: none"> <li>Inputs, max.</li> <li>Outputs, max.</li> </ul> </li> <li>Submodules               <ul style="list-style-type: none"> <li>Number, max.</li> <li>User data per submodule, max.</li> </ul> </li> </ul>                                                                                                                                              |                                                                                                                                                                              | Yes; With SFB 73 / 74 prepared for loadable PROFenergy standard FB for I-Device<br>Yes<br>2<br><br>1 440 byte; Per IO controller with shared device<br>1 440 byte; Per IO controller with shared device<br><br>64<br>1 024 byte |
| PROFINET CBA <ul style="list-style-type: none"> <li>acyclic transmission</li> <li>cyclic transmission</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Yes<br>Yes                                                                                                                                                                   | Yes<br>Yes                                                                                                                                                                                                                      |
| Open IE communication <ul style="list-style-type: none"> <li>Open IE communication, supported</li> <li>Number of connections, max.</li> <li>Local port numbers used at the system end</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Yes; Via TCP/IP, ISO on TCP, and UDP<br>8<br>0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535                                     | Yes; Via TCP/IP, ISO on TCP, and UDP<br>8<br>0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535                                                                                        |
| <b>2nd interface</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                              |                                                                                                                                                                                                                                 |
| Type of interface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | External interface via master module 6ES7138-4HA00-0AB0                                                                                                                      | External interface via master module 6ES7138-4HA00-0AB0                                                                                                                                                                         |
| Physics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | RS 485                                                                                                                                                                       | RS 485                                                                                                                                                                                                                          |
| Isolated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Yes                                                                                                                                                                          | Yes                                                                                                                                                                                                                             |
| Power supply to interface (15 to 30 V DC), max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | No                                                                                                                                                                           | No                                                                                                                                                                                                                              |
| Functionality <ul style="list-style-type: none"> <li>MPI</li> <li>DP master</li> <li>DP slave</li> <li>PROFINET IO controller</li> <li>PROFINET IO device</li> <li>PROFINET CBA</li> <li>Open IE communication</li> <li>Web server</li> <li>Local Operating Network</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                        | No<br>Yes<br>No<br>No<br>No<br>No<br>No<br>No<br>No                                                                                                                          | No<br>Yes<br>No<br>No<br>No<br>No<br>No<br>No<br>No                                                                                                                                                                             |
| DP master <ul style="list-style-type: none"> <li>Number of connections, max.</li> <li>Services               <ul style="list-style-type: none"> <li>PG/OP communication</li> <li>Routing</li> <li>Global data communication</li> <li>S7 basic communication</li> <li>S7 communication</li> <li>S7 communication, as client</li> <li>S7 communication, as server</li> <li>Equidistance mode support</li> <li>Isochronous mode</li> <li>SYNC/FREEZE</li> <li>Activation/deactivation of DP slaves</li> <li>Number of DP slaves that can be simultaneously activated/deactivated, max.</li> <li>Direct data exchange (slave-to-slave communication)</li> <li>DPV1</li> </ul> </li> </ul> | 12; Notice: 12 connections per CPU, not per interface<br><br>Yes<br>Yes<br>No<br>Yes; I blocks only<br>Yes<br>No<br>Yes<br>Yes<br>Yes<br>No<br>Yes<br>Yes<br>8<br>Yes<br>Yes | Yes<br>Yes<br>No<br>Yes; I blocks only<br>Yes<br>No<br>Yes<br>Yes<br>Yes<br>No<br>Yes<br>Yes<br>8<br>Yes<br>Yes                                                                                                                 |

## SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules with CPU  
IM 151-8 PN/DP CPU

## Technical specifications (continued)

|                                                                                                                                                                                                                                                                                                                                                                  | 6ES7 151-8AB00-0AB0                                                                      | 6ES7 151-8AB01-0AB0                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Transmission rate, max.</li> <li>• Number of DP slaves, max.</li> <li>• Address area <ul style="list-style-type: none"> <li>- Inputs, max.</li> <li>- Outputs, max.</li> </ul> </li> <li>• User data per DP slave <ul style="list-style-type: none"> <li>- Inputs, max.</li> <li>- Outputs, max.</li> </ul> </li> </ul> | 12 Mbit/s<br>32; Per station<br><br>2 048 byte<br>2 048 byte<br><br>244 byte<br>244 byte | 12 Mbit/s<br>32; Per station<br><br>2 048 byte<br>2 048 byte<br><br>244 byte<br>244 byte |
| <b>Isochronous mode</b>                                                                                                                                                                                                                                                                                                                                          |                                                                                          |                                                                                          |
| Isochronous mode                                                                                                                                                                                                                                                                                                                                                 | No                                                                                       | No                                                                                       |
| <b>Programming</b>                                                                                                                                                                                                                                                                                                                                               |                                                                                          |                                                                                          |
| Programming language                                                                                                                                                                                                                                                                                                                                             |                                                                                          |                                                                                          |
| • STEP 7                                                                                                                                                                                                                                                                                                                                                         | Yes; V5.4 SP4                                                                            | Yes; V5.5 or higher                                                                      |
| • LAD                                                                                                                                                                                                                                                                                                                                                            | Yes                                                                                      | Yes                                                                                      |
| • FBD                                                                                                                                                                                                                                                                                                                                                            | Yes                                                                                      | Yes                                                                                      |
| • STL                                                                                                                                                                                                                                                                                                                                                            | Yes                                                                                      | Yes                                                                                      |
| • SCL                                                                                                                                                                                                                                                                                                                                                            | Yes; optional                                                                            | Yes; optional                                                                            |
| • CFC                                                                                                                                                                                                                                                                                                                                                            | Yes; optional                                                                            | Yes; optional                                                                            |
| • GRAPH                                                                                                                                                                                                                                                                                                                                                          | Yes; optional                                                                            | Yes; optional                                                                            |
| • HiGraph®                                                                                                                                                                                                                                                                                                                                                       | Yes; optional                                                                            | Yes; optional                                                                            |
| Command set                                                                                                                                                                                                                                                                                                                                                      | See instruction list                                                                     | See instruction list                                                                     |
| Nesting levels                                                                                                                                                                                                                                                                                                                                                   | 8                                                                                        | 8                                                                                        |
| Know-how protection                                                                                                                                                                                                                                                                                                                                              |                                                                                          |                                                                                          |
| • User program protection/password protection                                                                                                                                                                                                                                                                                                                    | Yes                                                                                      | Yes                                                                                      |
| • Block encryption                                                                                                                                                                                                                                                                                                                                               |                                                                                          | Yes; With S7 block Privacy                                                               |
| System functions (SFC)                                                                                                                                                                                                                                                                                                                                           | See instruction list                                                                     | See instruction list                                                                     |
| System function blocks (SFB)                                                                                                                                                                                                                                                                                                                                     | See instruction list                                                                     | See instruction list                                                                     |
| <b>Alarms/diagnostics/status information</b>                                                                                                                                                                                                                                                                                                                     |                                                                                          |                                                                                          |
| Alarms                                                                                                                                                                                                                                                                                                                                                           |                                                                                          |                                                                                          |
| • Alarms                                                                                                                                                                                                                                                                                                                                                         | Yes                                                                                      | Yes                                                                                      |
| Diagnostics                                                                                                                                                                                                                                                                                                                                                      |                                                                                          |                                                                                          |
| • Diagnostic functions                                                                                                                                                                                                                                                                                                                                           | Yes                                                                                      | Yes                                                                                      |
| Diagnostic indication LED                                                                                                                                                                                                                                                                                                                                        |                                                                                          |                                                                                          |
| • Bus activity PROFINET P1-LINK (green)                                                                                                                                                                                                                                                                                                                          | Yes                                                                                      | Yes                                                                                      |
| • Bus activity PROFINET P2-LINK (green)                                                                                                                                                                                                                                                                                                                          | Yes                                                                                      | Yes                                                                                      |
| • Bus activity PROFINET P3-LINK (green)                                                                                                                                                                                                                                                                                                                          | Yes                                                                                      | Yes                                                                                      |
| • Bus error (red)                                                                                                                                                                                                                                                                                                                                                | Yes                                                                                      | Yes                                                                                      |
| • Maintenance information MT (yellow)                                                                                                                                                                                                                                                                                                                            | Yes                                                                                      | Yes                                                                                      |
| • Group error SF (red)                                                                                                                                                                                                                                                                                                                                           | Yes                                                                                      | Yes                                                                                      |
| • Monitoring 24 V voltage supply ON (green)                                                                                                                                                                                                                                                                                                                      | Yes                                                                                      | Yes                                                                                      |
| <b>Isolation</b>                                                                                                                                                                                                                                                                                                                                                 |                                                                                          |                                                                                          |
| Isolation checked with                                                                                                                                                                                                                                                                                                                                           | 500 V DC                                                                                 | 500 V DC                                                                                 |
| <b>Galvanic isolation</b>                                                                                                                                                                                                                                                                                                                                        |                                                                                          |                                                                                          |
| between load voltage and all other switching components                                                                                                                                                                                                                                                                                                          | Yes                                                                                      |                                                                                          |
| between PROFIBUS DP and all other circuit components                                                                                                                                                                                                                                                                                                             | Yes                                                                                      | Yes                                                                                      |
| <b>Permissible potential difference</b>                                                                                                                                                                                                                                                                                                                          |                                                                                          |                                                                                          |
| between different circuits                                                                                                                                                                                                                                                                                                                                       | 75 V DC / 60 V AC                                                                        | 75 V DC / 60 V AC                                                                        |
| <b>Dimensions and weight</b>                                                                                                                                                                                                                                                                                                                                     |                                                                                          |                                                                                          |
| Dimensions                                                                                                                                                                                                                                                                                                                                                       |                                                                                          |                                                                                          |
| • Width                                                                                                                                                                                                                                                                                                                                                          | 120 mm; DP master module: 35 mm                                                          | 120 mm; DP master module: 35 mm                                                          |
| • Height                                                                                                                                                                                                                                                                                                                                                         | 119.5 mm                                                                                 | 119.5 mm                                                                                 |
| • Depth                                                                                                                                                                                                                                                                                                                                                          | 75 mm                                                                                    | 75 mm                                                                                    |
| Weight                                                                                                                                                                                                                                                                                                                                                           |                                                                                          |                                                                                          |
| • Weight, approx.                                                                                                                                                                                                                                                                                                                                                | 320 g; DP master module: Approx. 100 g                                                   | 320 g; DP master module: Approx. 100 g                                                   |

| Ordering data                                                                                                                                                                                | Order No.                                                                                                            | Order No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IM 151-8F PN/DP CPU interface module (192 K)</b><br>including termination module                                                                                                          | <b>6ES7 151-8AB01-0AB0</b>                                                                                           | <b>ET 200S distributed I/O system manuals</b><br><br>are available on the Internet as PDF files<br><a href="http://www.siemens.com/simatic-docu">www.siemens.com/simatic-docu</a>                                                                                                                                                                                                                                                                                                                                                  |
| <b>Accessories</b>                                                                                                                                                                           |                                                                                                                      | <b>Termination module</b><br>as spare part for ET 200S                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>MMC 64 kByte <sup>1)</sup></b><br>for program backup                                                                                                                                      | <b>6ES7 953-8LF20-0AA0</b>                                                                                           | <b>6ES7 193-4JA00-0AA0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>MMC 128 kByte <sup>1)</sup></b><br>for program backup                                                                                                                                     | <b>6ES7 953-8LG20-0AA0</b>                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>MMC 512 kByte <sup>1)</sup></b><br>for program backup                                                                                                                                     | <b>6ES7 953-8LJ20-0AA0</b>                                                                                           | <b>SIMATIC S5, 35 mm DIN rail</b><br>• Length: 483 mm for 19" cabinets<br>• Length: 530 mm for 600 mm cabinets<br>• Length: 830 mm for 900 mm cabinets<br>• 2 m long                                                                                                                                                                                                                                                                                                                                                               |
| <b>MMC 2 MByte <sup>1)</sup></b><br>for program backup and/or firmware update                                                                                                                | <b>6ES7 953-8LL20-0AA0</b>                                                                                           | <b>6ES5 710-8MA11</b><br><b>6ES5 710-8MA21</b><br><br><b>6ES5 710-8MA31</b><br><br><b>6ES5 710-8MA41</b>                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>MMC 4 MByte <sup>1)</sup></b><br>for program backup                                                                                                                                       | <b>6ES7 953-8LM20-0AA0</b>                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>MMC 8 MByte <sup>1)</sup></b><br>for program backup                                                                                                                                       | <b>6ES7 953-8LP20-0AA0</b>                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>External prommer</b><br>for MMC, among others, with USB interface                                                                                                                         | <b>6ES7 792-0AA00-0XA0</b>                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>PG</b><br>with integrated MMC interface                                                                                                                                                   | On request                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Label sheets DIN A4 (10 units)</b><br><br>Each sheet contains 60 label strips for I/O modules and 20 label strips for interface modules<br>• petrol<br>• red<br>• yellow<br>• light beige | <b>6ES7 193-4BH00-0AA0</b><br><b>6ES7 193-4BD00-0AA0</b><br><b>6ES7 193-4BB00-0AA0</b><br><b>6ES7 193-4BA00-0AA0</b> | <b>Industrial Ethernet FC RJ45 Plug 180</b><br><br>RJ45 connector for Industrial Ethernet with rugged metal enclosure and integrated insulation displacement contacts for connecting the Industrial Ethernet FC installation cables; with 180° cable outlet<br>• 1 unit<br>• 10 units<br>• 50 units<br><br><b>Industrial Ethernet FastConnect Installation Cable</b><br>• Fast Connect Standard Cable<br>• Fast Connect Trailing Cable<br>• Fast Connect Marine Cable<br><br><b>Industrial Ethernet FastConnect Stripping Tool</b> |
|                                                                                                                                                                                              |                                                                                                                      | <b>6GK1 901-1BB10-2AA0</b><br><b>6GK1 901-1BB10-2AB0</b><br><b>6GK1 901-1BB10-2AE0</b><br><br><b>6XV1 840-2AH10</b><br><b>6XV1 840-3AH10</b><br><b>6XV1 840-4AH10</b><br><br><b>6GK1 901-1GA00</b>                                                                                                                                                                                                                                                                                                                                 |

<sup>1)</sup>An MMC is essential to operate the CPU

I: Subject to export regulations AL: N and ECCN: EAR99H



# SIMATIC ET 200 distributed I/O

## ET 200S

### Interface modules with CPU Master interface module for IM 151 CPU

#### Overview



PROFIBUS DP master interface module for IM 151-7(F) CPU/IM 151-8(F) PN/DP CPU interface modules

- Integrated 12 Mbit/s PROFIBUS DP master interface in copper design
- Facilitates parallel operation of two PROFIBUS DP interfaces on one IM 151-7 CPU
- Enables operation of a PROFIBUS DP interface on an IM 151-8(F) PN/DP CPU
- Increases the availability of plants and machinery
- Functionality corresponds to the interface of an S7-300 CPU 314-2 DP configured as DP master

Programming is with STEP7 from Version V5.2 with Service Pack 1.

#### Technical specifications

| 6ES7 138-4HA00-0AB0           |          |
|-------------------------------|----------|
| <b>Hardware configuration</b> |          |
| Number of modules per CPU     | 1        |
| <b>Dimensions and weight</b>  |          |
| Dimensions                    |          |
| • Width                       | 35 mm    |
| • Height                      | 119.5 mm |
| • Depth                       | 75 mm    |
| Weight                        |          |
| • Weight, approx.             | 100 g    |

#### Ordering data

| Order No.                                                                                                                      |                            |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Master interface module for IM 151-7 CPU / IM 151-7 F CPU / IM 151-8 PN/DP CPU / IM 151-8 F PN/DP CPU interface modules</b> | <b>6ES7 138-4HA00-0AB0</b> |
| <b>Accessories</b>                                                                                                             |                            |
| <b>Label sheets DIN A4 (10 units)</b>                                                                                          |                            |
| Each sheet contains 60 label strips for I/O modules and 20 label strips for interface modules                                  |                            |
| • petrol                                                                                                                       | <b>6ES7 193-4BH00-0AA0</b> |
| • red                                                                                                                          | <b>6ES7 193-4BD00-0AA0</b> |
| • yellow                                                                                                                       | <b>6ES7 193-4BB00-0AA0</b> |
| • light beige                                                                                                                  | <b>6ES7 138-4BA00-0AA0</b> |
| <b>ET 200S distributed I/O system manuals</b>                                                                                  |                            |
| are available in the Internet as PDF files:                                                                                    |                            |
| <a href="http://www.siemens.com/simatic-docu">www.siemens.com/simatic-docu</a>                                                 |                            |

## Overview



- Interface module for SIMATIC ET 200S with integrated S7-CPU 314
- For high-performance control solutions in ET 200S
- Increase of the availability of systems and machines
- Programming via PROFIBUS DP
- Compact SIMATIC micro memory card (MMC)
- Integrated 12 Mbit/s PROFIBUS DP slave/MPI interface in Cu version
- Integrated CPU based on the CPU S7-314
- IM 151-7 CPU FO available
- Fail-safe IM 151-7 F CPU PROFIsafe available
- Alternatively as IM 151-8 (F) PN/DP CPU with PROFINET interface

Micro Memory Card required for CPU operation.

**Note:**

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

| SIPLUS IM 151-7 CPU                                                          |                                                                                                                                                                                              |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Order No.</b>                                                             | <b>6AG1151-7AA20-7AB0</b>                                                                                                                                                                    |
| <b>Order No. based on</b>                                                    | <b>6ES7151-7AA20-0AB0</b>                                                                                                                                                                    |
| Ambient temperature range                                                    | -25 °C to +70 °C                                                                                                                                                                             |
| Conformal coating                                                            | Coating of the printed circuit boards and the electronic components                                                                                                                          |
| Technical data                                                               | The technical data of the standard product applies except for the ambient conditions.                                                                                                        |
| Relative humidity                                                            | 5 ... 100 %, condensation permitted                                                                                                                                                          |
| <b>Ambient conditions</b>                                                    |                                                                                                                                                                                              |
| Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                                |
| Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                                        |
| Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                                        |
| Air pressure (depending on the highest positive temperature range specified) | 1080...795 hPa<br>(-1000 ... +2000 m)<br>See ambient temperature range<br>795 ... 658 hPa<br>(+2000 ... +3500 m)<br>Derating 10 K<br>658 ... 540 hPa<br>(+3500 ... +5000 m)<br>derating 20 K |

- 1) ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm; H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O<sub>3</sub> < 0.1 ppm; NOX < 5.2 ppm  
Limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O<sub>3</sub> < 1.0 ppm; NOX < 10.4 ppm

- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

| Ordering data                                      | Order No.                                            |
|----------------------------------------------------|------------------------------------------------------|
| <b>SIPLUS IM 151-7 CPU interface module (96 K)</b> | <b>6AG1 151-7AA20-7AB0</b>                           |
| (extended temperature range and medial exposure)   |                                                      |
| Including termination module                       |                                                      |
| <b>Accessories</b>                                 | See SIMATIC IM 151-7 CPU interface module, page 9/13 |

H: Subject to export regulations AL: 9I999 and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200S

### SIPLUS interface modules with CPU SIPLUS IM 151-8 PN/DP CPU

#### Overview



- Interface module for SIMATIC ET 200S with integrated CPU S7-314
- For high-performance control solutions in ET 200S
- Increase in the availability of systems and machines
- PROFINET IO-Controller for up to 128 IO-Devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET I/O-Controller
- PROFINET interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With many communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), Web server and S7 communication (with loadable FBs)
- Fast, simple and uniform programming of a system with modular programs via STEP 7
- Compact SIMATIC micro memory card (MMC)
- Optional PROFIBUS master for 32 PROFIBUS DP slaves (with master interface 6ES7 138-4HA00-0AB0)
- Fail-safe IM 151-8F PN/DP CPU PROFIsafe available

Micro Memory Card required for CPU operation.

#### Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### SIPLUS IM 151-8 PN/DP CPU

|                           |                                                                                       |                     |
|---------------------------|---------------------------------------------------------------------------------------|---------------------|
| Order No.                 | 6AG1 151-8AB00-4AB0                                                                   | 6AG1 151-8AB00-7AB0 |
| Order No. based on        | 6ES7 151-8AB00-0AB0                                                                   | 6ES7 151-8AB00-0AB0 |
| Ambient temperature range | 0 ... +60 °C                                                                          | -25 ... +70 °C      |
| Conformal coating         | Coating of the printed circuit boards and the electronic components                   |                     |
| Technical data            | The technical data of the standard product applies except for the ambient conditions. |                     |

#### SIPLUS IM 151-8 PN/DP CPU

##### Ambient conditions:

- Relative humidity  
5 ... 100%, condensation allowed  
Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores fauna)
- Biologically active substances  
Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>
- Chemically active substances  
Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>
- Mechanically active substances  
1080...795 hPa (-1000 ... +2000 m)  
See ambient temperature range
- Air pressure (depending on the highest positive temperature range specified)  
795...658 hPa (+2000 ... +3500 m)  
Derating 10 K  
658...540 hPa (+3500 ... +5000m)  
Derating 20K

- 1) ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> <4.8 ppm; H<sub>2</sub>S <9.9 ppm; Cl <0.2 ppm; HCl <0.66 ppm; HF <0.12 ppm; NH<sub>3</sub> <49 ppm; O<sub>3</sub> <0.1 ppm; NOX <5.2 ppm  
Threshold / limit value (max. 30 min/d): SO<sub>2</sub> <17.8 ppm; H<sub>2</sub>S <49.7 ppm; Cl <1.0 ppm; HCl <3.3 ppm; HF <2.4 ppm; NH<sub>3</sub> <247 ppm; O<sub>3</sub> <1.0 ppm; NOX <10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

#### Ordering data

#### Order No.

##### SIPLUS interface module IM 151-8 PN/DP CPU

(extended temperature range and medial exposure)

Including termination module

- For areas with extreme medial stress (conformal coating)
- For areas with extreme medial stress (conformal coating); ambient temperature -25 ... +70 °C

**6AG1 151-8AB00-4AB0**

**6AG1 151-8AB00-7AB0**

##### Accessories

See SIMATIC IM 151-8 PN/DP CPU interface module, page 9/23

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200S

### SIPLUS interface modules with CPU

#### SIPLUS master interface module for IM 151 CPU

#### Overview



PROFIBUS DP master interface module for interface module IM 151-7 (R) CPU / IM 151-8 (F) PN/DP CPU

- Integrated 12 Mbit/s PROFIBUS DP master interface in Cu version
- Allows parallel operation of two PROFIBUS DP interfaces on one IM 151-7 CPU
- Allows operation of one PROFIBUS DP interface with an IM 151-8 (F) PN/DP CPU
- Increase in availability of systems and machines
- Functionality in accordance with a DP master configured interface of an S7-314 CPU

Programming is performed with STEP 7 from version V5.2 with Service Pack 1.

#### Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

| SIPLUS master interface module for IM 151 CPU                                |                                                                                                                                                                                                |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Order number</b>                                                          | <b>6AG1 138-4HA00-7AB0</b>                                                                                                                                                                     |
| <b>Order No. based on</b>                                                    | <b>6ES7 138-4HA00-0AB0</b>                                                                                                                                                                     |
| Ambient temperature range                                                    | -25 °C to +70 °C                                                                                                                                                                               |
| Conformal coating                                                            | Coating of the printed circuit boards and the electronic components                                                                                                                            |
| Technical data                                                               | The technical data of the standard product applies except for the ambient conditions.                                                                                                          |
| <b>Ambient conditions</b>                                                    |                                                                                                                                                                                                |
| Relative humidity                                                            | 5 ... 100 %<br>Condensation permissible                                                                                                                                                        |
| Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                                  |
| Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                                          |
| Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                                          |
| Air pressure (depending on the highest positive temperature range specified) | 1080 ... 795 hPa<br>(-1000 ... +2000 m)<br>See ambient temperature range<br>795 ... 658 hPa<br>(+2000 ... +3500 m)<br>derating 10 K<br>658 ... 540 hPa<br>(+3500 ... +5000 m)<br>derating 20 K |

- 1) ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm; H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH<sub>3</sub> < 49 ppm; O<sub>3</sub> < 0.1 ppm; NO<sub>x</sub> < 5.2 ppm  
Limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH<sub>3</sub> < 247 ppm; O<sub>3</sub> < 1.0 ppm; NO<sub>x</sub> < 10.4 ppm

- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

| Ordering data                                                                                                                                                                             | Order No.                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| <b>Master interface module for SIPLUS IM 151-7 CPU / IM 151-7 F CPU / IM 151-8 PN/DP CPU / IM 151-8 F PN/DP CPU interface modules</b><br>(extended temperature range and medial exposure) | <b>6AG1 138-4HA00-7AB0</b>                                    |
| <b>Accessories</b>                                                                                                                                                                        | See SIMATIC master interface module for IM 151 CPU, page 9/24 |

H: Subject to export regulations AL: 9I999 and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200S

### Interface modules with fail-safe CPU IM 151-7 F-CPU

#### Overview



- Interface module with integrated fail-safe CPU for SIMATIC ET 200S
- With DP/MPI interface
- For design of a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061 and Cat. 4 according to EN 954-1
- Fail-safe I/O modules can be connected in a distributed configuration through DP master modules (PROFIsafe)
- The fail-safe I/O modules of ET200S PROFIsafe can be connected in a centralized configuration
- Standard modules can be used for non-safety-relevant applications

#### Note:

Micro Memory Card required for operation of CPU.

#### Technical specifications

| 6ES7 151-7FA20-0AB0                                                                                                                                                                                              |                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Product version</b><br>associated programming package                                                                                                                                                         | STEP 7 V5.2 + SP1 or higher with HW update                                                    |
| <b>Supply voltages</b><br>Load voltage L+<br>• Rated value (DC)<br>• Permissible range, lower limit (DC)<br>• Permissible range, upper limit (DC)<br>• Short-circuit protection<br>• Reverse polarity protection | 24 V<br>20.4 V<br>28.8 V<br>Yes<br>Yes                                                        |
| <b>Current consumption</b><br>Current output to backplane bus (5 V DC), max.<br>from supply voltage 1L+, max.                                                                                                    | 700 mA<br>250 mA; 280 mA with DP master module                                                |
| <b>Power losses</b><br>Power loss, typ.                                                                                                                                                                          | 3.3 W                                                                                         |
| <b>Memory</b><br>Work memory<br>• integrated<br>• expandable<br>Load memory<br>• pluggable (MMC)<br>• pluggable (MMC), max.                                                                                      | 128 Kibyte; For program and data<br>No<br>Yes<br>8 Mbyte                                      |
| <b>CPU-blocks</b><br>Number of blocks (total)                                                                                                                                                                    | 1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. |
| DB<br>• Number, max.<br>• Size, max.                                                                                                                                                                             | 511; Number range: 1 to 511<br>16 Kibyte                                                      |
| FB<br>• Number, max.<br>• Size, max.                                                                                                                                                                             | 1 024; Number range: 0 to 2047<br>16 Kibyte                                                   |

| 6ES7 151-7FA20-0AB0                                                                                                                                                                                                      |                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| FC<br>• Number, max.<br>• Size, max.                                                                                                                                                                                     | 1 024; Number range: 0 to 2047<br>16 Kibyte             |
| OB<br>• Size, max.                                                                                                                                                                                                       | 16 Kibyte                                               |
| Nesting depth<br>• per priority class<br>• additional within an error OB                                                                                                                                                 | 8<br>4                                                  |
| <b>CPU processing times</b><br>for bit operations, min.<br>for word operations, min.<br>for fixed point arithmetic, min.<br>for floating point arithmetic, min.                                                          | 0.1 µs<br>0.2 µs<br>2 µs<br>3 µs                        |
| <b>Counters, timers and their retentivity</b><br>S7 counter<br>• Number<br>• Retentivity<br>- adjusted<br>- lower limit<br>- upper limit<br>- preset<br>• Counting range<br>- adjusted<br>- lower limit<br>- upper limit | 256<br>Yes<br>0<br>255<br>Z 0 to Z 7<br>Yes<br>0<br>999 |
| IEC counter<br>• Type<br>• Number                                                                                                                                                                                        | SFB<br>Unlimited (limited only by RAM capacity)         |
| S7 times<br>• Number<br>• Retentivity<br>- adjusted<br>- lower limit<br>- upper limit<br>- preset                                                                                                                        | 256<br>Yes<br>0<br>255<br>No retentivity                |

## Technical specifications (continued)

| 6ES7 151-7FA20-0AB0                                               |                                                    |
|-------------------------------------------------------------------|----------------------------------------------------|
| S7 times                                                          |                                                    |
| • Time range                                                      | 10 ms                                              |
| - lower limit                                                     | 9 990 s                                            |
| - upper limit                                                     |                                                    |
| IEC timer                                                         |                                                    |
| • Type                                                            | SFB                                                |
| • Number                                                          | Unlimited (limited only by RAM capacity)           |
| <b>Data areas and their retentivity</b>                           |                                                    |
| retentive data area in total (incl. times, counters, flags), max. | 64 Kibyte                                          |
| Flag                                                              |                                                    |
| • Number, max.                                                    | 256 byte                                           |
| • Retentivity available                                           | Yes                                                |
| • Retentivity preset                                              | MB 0 to MB 15                                      |
| • Number of clock memories                                        | 8; 1 memory byte                                   |
| Data blocks                                                       |                                                    |
| • Number, max.                                                    | 511; Number range: 1 to 511                        |
| • Size, max.                                                      | 16 Kibyte                                          |
| Local data                                                        |                                                    |
| • per priority class, max.                                        | 510 byte                                           |
| <b>Address area</b>                                               |                                                    |
| I/O address area                                                  |                                                    |
| • Overall                                                         | 2 048 byte                                         |
| • Outputs                                                         | 2 048 byte                                         |
| Process image                                                     |                                                    |
| • Inputs                                                          | 128 byte; Not adjustable                           |
| • Outputs                                                         | 128 byte; Not adjustable                           |
| Digital channels                                                  |                                                    |
| • Inputs                                                          | 16 336                                             |
| • Outputs                                                         | 16 336                                             |
| • Inputs, of which central                                        | 248                                                |
| • Outputs, of which central                                       | 248                                                |
| Analog channels                                                   |                                                    |
| • Inputs                                                          | 1 021                                              |
| • Outputs                                                         | 1 021                                              |
| • Inputs, of which central                                        | 124                                                |
| • Outputs, of which central                                       | 124                                                |
| <b>Hardware configuration</b>                                     |                                                    |
| Number of modules per system, max.                                | 63; Centralized                                    |
| <b>Time</b>                                                       |                                                    |
| Clock                                                             |                                                    |
| • Hardware clock (real-time clock)                                | Yes                                                |
| • Battery-backed and synchronizable                               | Yes                                                |
| • Backup time                                                     | 6 wk; at 40 °C ambient temperature, typically 10 s |
| • Deviation per day, max.                                         |                                                    |
| Runtime meter                                                     |                                                    |
| • Number                                                          | 1                                                  |
| • Number/Number range                                             | 0                                                  |
| • Range of values                                                 | 0 to 2 <sup>31</sup> hours (when using SFC 101)    |
| • Granularity                                                     | 1 hour                                             |
| • Retentive                                                       | Yes; must be restarted at each restart             |

| 6ES7 151-7FA20-0AB0                                  |                                                                                  |
|------------------------------------------------------|----------------------------------------------------------------------------------|
| Clock synchronization                                |                                                                                  |
| • supported                                          | Yes                                                                              |
| • to MPI, master                                     | Yes                                                                              |
| • to MPI, slave                                      | Yes                                                                              |
| • in AS, master                                      | No                                                                               |
| • in AS, slave                                       | No                                                                               |
| <b>S7 message functions</b>                          |                                                                                  |
| Number of login stations for message functions, max. | 12; depending on the configured connections for PG/OP and S7 basic communication |
| Process diagnostic messages                          | Yes; ALARM_S, ALARM_SC, ALARM_SQ, ALARM_D, ALARM_DQ                              |
| Simultaneously active Alarm-S blocks, max.           | 40                                                                               |
| <b>Test commissioning functions</b>                  |                                                                                  |
| Status/control                                       |                                                                                  |
| • Status/control variable                            | Yes                                                                              |
| • Variables                                          | Inputs, outputs, memory bits, DB, times, counters                                |
| • Number of variables, max.                          | 30                                                                               |
| • of which status variables, max.                    | 30                                                                               |
| • of which control variables, max.                   | 14                                                                               |
| Forcing                                              |                                                                                  |
| • Forcing                                            | Yes                                                                              |
| Status block                                         | Yes                                                                              |
| Single step                                          | Yes                                                                              |
| Number of breakpoints                                | 2                                                                                |
| Diagnostic buffer                                    |                                                                                  |
| • Present                                            | Yes                                                                              |
| • Number of entries, max.                            | 100                                                                              |
| - adjusted                                           | No                                                                               |
| <b>Communication functions</b>                       |                                                                                  |
| PG/OP communication                                  | Yes                                                                              |
| Global data communication                            |                                                                                  |
| • Supported                                          | Yes                                                                              |
| • Number of GD packets, max.                         | 4                                                                                |
| • Number of GD packets, transmitter, max.            | 4                                                                                |
| • Number of GD packets, receiver, max.               | 4                                                                                |
| • Size of GD packets, max.                           | 22 byte                                                                          |
| • Size of GD packet (of which consistent), max.      | 22 byte                                                                          |
| S7 basic communication                               |                                                                                  |
| • supported                                          | Yes                                                                              |
| • User data per job, max.                            | 76 byte                                                                          |
| • User data per job (of which consistent), max.      | 76 byte; 76 byte (with X_SEND or X_RCV); 64 byte (with X_PUT or X_GET as server) |
| S7 communication                                     |                                                                                  |
| • supported                                          | Yes                                                                              |
| • as server                                          | Yes                                                                              |
| • as client                                          | No                                                                               |
| • User data per job, max.                            | 180 byte                                                                         |
| • User data per job (of which consistent), max.      | 64 byte                                                                          |

## SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules with fail-safe CPU  
IM 151-7 F-CPU

## Technical specifications (continued)

| 6ES7 151-7FA20-0AB0                                   |                                                                                |
|-------------------------------------------------------|--------------------------------------------------------------------------------|
| S5-compatible communication                           |                                                                                |
| • supported                                           | No                                                                             |
| Standard communication (FMS)                          |                                                                                |
| • supported                                           | No                                                                             |
| Number of connections                                 |                                                                                |
| • overall                                             | 12                                                                             |
| • usable for PG communication                         | 11                                                                             |
| - reserved for PG communication                       | 1                                                                              |
| • usable for OP communication                         | 11                                                                             |
| - reserved for OP communication                       | 1                                                                              |
| • usable for S7 basic communication                   | 10                                                                             |
| - Reserved for S7 basic communication                 | 0                                                                              |
| • usable for routing                                  | 4; as slave only with active interface, with IM 151-7 CPU as DP master         |
| <b>1st interface</b>                                  |                                                                                |
| Type of interface                                     | Integrated RS 485 interface                                                    |
| Physics                                               | RS 485                                                                         |
| Isolated                                              | Yes                                                                            |
| Power supply to interface (15 to 30 V DC), max.       | 80 mA                                                                          |
| Functionality                                         |                                                                                |
| • MPI                                                 | Yes                                                                            |
| • DP master                                           | No                                                                             |
| • DP slave                                            | Yes; active / passive                                                          |
| • Point-to-point connection                           | No                                                                             |
| MPI                                                   |                                                                                |
| • Number of connections                               | 12; Notice: 12 connections per CPU, not per interface                          |
| • Services                                            |                                                                                |
| - PG/OP communication                                 | Yes                                                                            |
| - Routing                                             | Yes; with master module                                                        |
| - Global data communication                           | Yes                                                                            |
| - S7 basic communication                              | Yes                                                                            |
| - S7 communication                                    | Yes                                                                            |
| - S7 communication, as client                         | No                                                                             |
| - S7 communication, as server                         | Yes                                                                            |
| • Transmission rate, max.                             | 12 Mbit/s                                                                      |
| DP slave                                              |                                                                                |
| • Number of connections                               | 12; Notice: 12 connections per CPU, not per interface                          |
| • Services                                            |                                                                                |
| - Routing                                             | Yes; only when interface active and in master mode                             |
| - Direct data exchange (slave-to-slave communication) | Yes                                                                            |
| - DPV1                                                | No                                                                             |
| • GSD file                                            | <a href="http://www.siemens.com/profibus-gsd">www.siemens.com/profibus-gsd</a> |
| • Transmission rate, max.                             | 12 Mbit/s                                                                      |
| • Automatic baud rate search                          | Yes; only with passive interface                                               |
| • Transfer memory                                     |                                                                                |
| - Inputs                                              | 244 byte                                                                       |
| - Outputs                                             | 244 byte                                                                       |

| 6ES7 151-7FA20-0AB0                                   |                                                                                                                                                                              |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DP slave                                              |                                                                                                                                                                              |
| • Address area, max.                                  | 32                                                                                                                                                                           |
| • User data per address area, max.                    | 32 byte; up to max. size of the transfer memory                                                                                                                              |
| <b>2nd interface</b>                                  |                                                                                                                                                                              |
| Type of interface                                     | External interface via master module 6ES7138-4HA00-0AB0                                                                                                                      |
| Physics                                               | RS 485                                                                                                                                                                       |
| Isolated                                              | Yes                                                                                                                                                                          |
| Power supply to interface (15 to 30 V DC), max.       | No                                                                                                                                                                           |
| Functionality                                         |                                                                                                                                                                              |
| • MPI                                                 | No                                                                                                                                                                           |
| • DP master                                           | Yes                                                                                                                                                                          |
| • Local Operating Network                             | No                                                                                                                                                                           |
| DP master                                             |                                                                                                                                                                              |
| • Number of connections, max.                         | 12; Notice: 12 connections per CPU, not per interface                                                                                                                        |
| • Services                                            |                                                                                                                                                                              |
| - PG/OP communication                                 | Yes                                                                                                                                                                          |
| - Routing                                             | Yes                                                                                                                                                                          |
| - Global data communication                           | No                                                                                                                                                                           |
| - S7 basic communication                              | Yes; I blocks only                                                                                                                                                           |
| - S7 communication                                    | Yes                                                                                                                                                                          |
| - S7 communication, as client                         | No                                                                                                                                                                           |
| - S7 communication, as server                         | Yes                                                                                                                                                                          |
| - Equidistance mode support                           | Yes                                                                                                                                                                          |
| - SYNC/FREEZE                                         | Yes                                                                                                                                                                          |
| - Activation/deactivation of DP slaves                | Yes                                                                                                                                                                          |
| - Direct data exchange (slave-to-slave communication) | Yes                                                                                                                                                                          |
| - DPV1                                                | Yes                                                                                                                                                                          |
| • Transmission rate, max.                             | 12 Mbit/s                                                                                                                                                                    |
| • Number of DP slaves, max.                           | 32; Per station                                                                                                                                                              |
| • Address area                                        |                                                                                                                                                                              |
| - Inputs, max.                                        | 2 Kibyte                                                                                                                                                                     |
| - Outputs, max.                                       | 2 Kibyte                                                                                                                                                                     |
| • User data per DP slave                              |                                                                                                                                                                              |
| - Inputs, max.                                        | 244 byte                                                                                                                                                                     |
| - Outputs, max.                                       | 244 byte                                                                                                                                                                     |
| <b>Isochronous mode</b>                               |                                                                                                                                                                              |
| Isochronous mode                                      | No                                                                                                                                                                           |
| <b>Programming</b>                                    |                                                                                                                                                                              |
| Configuration rules                                   | max. 63 I/O modules per station; station width < 1 m or < 2 m; max. 10 A per load group (power module); master interface module on right next to IM 151-7 CPU (X2 interface) |
| Programming language                                  |                                                                                                                                                                              |
| • STEP 7                                              | Yes                                                                                                                                                                          |
| • LAD                                                 | Yes                                                                                                                                                                          |
| • FBD                                                 | Yes                                                                                                                                                                          |
| • STL                                                 | Yes                                                                                                                                                                          |
| • SCL                                                 | Yes; optional                                                                                                                                                                |
| • GRAPH                                               | Yes; optional                                                                                                                                                                |



**Technical specifications** (continued)

|                                                            | 6ES7 151-7FA20-0AB0  |
|------------------------------------------------------------|----------------------|
| Command set                                                | See instruction list |
| Nesting levels                                             | 8                    |
| Know-how protection                                        |                      |
| • User program protection/<br>password protection          | Yes                  |
| System functions (SFC)                                     | See instruction list |
| System function blocks (SFB)                               | See instruction list |
| <b>Isolation</b>                                           |                      |
| Isolation checked with                                     | 500 V DC             |
| <b>Galvanic isolation</b>                                  |                      |
| between load voltage and all other<br>switching components | Yes                  |
| between PROFIBUS DP and all<br>other circuit components    | Yes                  |

|                                                                       | 6ES7 151-7FA20-0AB0                       |
|-----------------------------------------------------------------------|-------------------------------------------|
| <b>Permissible potential difference</b><br>between different circuits | 75 V DC / 60 V AC                         |
| <b>Dimensions and weight</b>                                          |                                           |
| Dimensions                                                            |                                           |
| • Width                                                               | 60 mm; DP master module: 35 mm            |
| • Height                                                              | 119.5 mm                                  |
| • Depth                                                               | 75 mm                                     |
| Weight                                                                |                                           |
| • Weight, approx.                                                     | 200 g; DP master module:<br>Approx. 100 g |

**Ordering data****Order No.**

|                                                                                                                                                    |                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>IM151-7 F CPU interface module</b>                                                                                                              | <b>6ES7 151-7FA20-0AB0</b> |
| For configuring a fail-safe<br>automation system                                                                                                   |                            |
| <b>Accessories</b>                                                                                                                                 |                            |
| <b>Distributed Safety V5.4<br/>programming tool</b>                                                                                                |                            |
| Task: Software for configuring fail-<br>safe user programs for SIMATIC<br>S7-300F, S7-400F, ET 200S<br>Requirements: STEP 7 V5.3 SP3<br>and higher |                            |
| Floating license                                                                                                                                   | <b>6ES7 833-1FC02-0YA5</b> |
| Software Update Service                                                                                                                            | <b>6ES7 833-1FC00-0YX2</b> |
| <b>Distributed Safety Upgrade</b>                                                                                                                  | <b>6ES7 833-1FC02-0YE5</b> |
| From V5.x to V5.3; Floating<br>license for 1 user                                                                                                  |                            |
| <b>MMC 64 kByte</b>                                                                                                                                | <b>6ES7 953-8LF20-0AA0</b> |
| for program backup                                                                                                                                 |                            |
| <b>MMC 128 kByte</b>                                                                                                                               | <b>6ES7 953-8LG20-0AA0</b> |
| for program backup                                                                                                                                 |                            |

**Order No.**

|                                              |                            |
|----------------------------------------------|----------------------------|
| <b>MMC 512 kByte</b>                         | <b>6ES7 953-8LJ20-0AA0</b> |
| for program backup                           |                            |
| <b>MMC 2 MByte</b>                           | <b>6ES7 953-8LL20-0AA0</b> |
| for program backup and/or<br>firmware update |                            |
| <b>MMC 4 MByte</b>                           | <b>6ES7 953-8LM20-0AA0</b> |
| for program backup                           |                            |
| <b>External prommer</b>                      | <b>6ES7 792-0AA00-0XA0</b> |
| for MMC with USB interface                   |                            |
| <b>Termination module</b>                    | <b>6ES7 193-4JA00-0AA0</b> |
| as spare part for ET 200S                    |                            |
| <b>SIMATIC S5, 35 mm DIN rail</b>            |                            |
| • Length: 483 mm for 19" cabinets            | <b>6ES5 710-8MA11</b>      |
| • Length: 530 mm for 600 mm<br>cabinets      | <b>6ES5 710-8MA21</b>      |
| • Length: 830 mm for 900 mm<br>cabinets      | <b>6ES5 710-8MA31</b>      |
| • 2 m long                                   | <b>6ES5 710-8MA41</b>      |



# SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules with fail-safe CPU  
IM 151-8 F PN/DP CPU

### Overview



- Interface module for SIMATIC ET 200S with integrated fail-safe CPU
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061, up to PLe according to ISO 13849-1:2006 and up to Cat. 4 according to EN 954-1
- For high-performance control solutions in ET 200S
- Increase of the availability of systems and machines
- PROFINET IO-Controller for up to 128 IO-Devices
- PROFINET interface with integrated 3-port switch
- With many communication options:  
PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7-communication (with loadable FBs)
- Fast, simple and uniform programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)
- Optional PROFIBUS master for 32 PROFIBUS DP slaves (with master interface 6ES7138-4HA00-0AB0)

Note:

SIMATIC Micro Memory Card required for operation of CPU.

### Technical specifications

| 6ES7 151-8FB01-0AB0                                                                                                  |                                                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product version</b><br>associated programming package                                                             | STEP 7 V 5.5 or higher, Distributed Safety V 5.4 SP4                                                                                                                                                                                                          |
| <b>Supply voltages</b><br>Rated value<br>• permissible range, lower limit (DC)                                       | 20.4 V                                                                                                                                                                                                                                                        |
| external protection for supply cables (recommendation)                                                               | 24 V DC/16 A miniature circuit breaker with type B and C tripping characteristics. Note: A 24 V DC/16 A miniature circuit breaker with type B tripping characteristics trips before and with type C tripping characteristic after the device protection fuse. |
| Mains buffering<br>• Mains/voltage failure stored energy time                                                        | 5 ms                                                                                                                                                                                                                                                          |
| <b>Current consumption</b><br>Inrush current, max.                                                                   | 1.8 A; typ.                                                                                                                                                                                                                                                   |
| $I^2t$                                                                                                               | 0.13 A <sup>2</sup> ·s                                                                                                                                                                                                                                        |
| Current output to backplane bus (DC 5 V), max.                                                                       | 700 mA                                                                                                                                                                                                                                                        |
| from supply voltage 1L+, max.                                                                                        | 352 mA; 426 mA with DP master module                                                                                                                                                                                                                          |
| <b>Power losses</b><br>Power loss, typ.                                                                              | 5.5 W                                                                                                                                                                                                                                                         |
| <b>Memory</b><br>Work memory<br>• integrated<br>• expandable<br>• size of retentive memory for retentive data blocks | 256 Kibyte; For program and data<br>No<br>64 kbyte                                                                                                                                                                                                            |

| 6ES7 151-8FB01-0AB0                                                      |                                                                                               |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Load memory<br>• pluggable (MMC)<br>• pluggable (MMC), max.              | Yes<br>8 Mbyte                                                                                |
| <b>CPU-blocks</b><br>Number of blocks (total)                            | 1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. |
| DB<br>• Number, max.<br>• Size, max.                                     | 1 024; Number range: 1 to 16,000<br>64 Kibyte                                                 |
| FB<br>• Number, max.<br>• Size, max.                                     | 1 024; Number range: 0 to 7,999<br>64 Kibyte                                                  |
| FC<br>• Number, max.<br>• Size, max.                                     | 1 024; Number range: 0 to 7,999<br>64 Kibyte                                                  |
| OB<br>• Size, max.                                                       | 64 Kibyte                                                                                     |
| Nesting depth<br>• per priority class<br>• additional within an error OB | 16<br>4                                                                                       |
| <b>CPU processing times</b><br>for bit operations, min.                  | 0.06 µs                                                                                       |
| for word operations, min.                                                | 0.12 µs                                                                                       |
| for fixed point arithmetic, min.                                         | 0.16 µs                                                                                       |
| for floating point arithmetic, min.                                      | 0.59 µs                                                                                       |

## Technical specifications (continued)

| 6ES7 151-8FB01-0AB0                           |                                          |
|-----------------------------------------------|------------------------------------------|
| <b>Counters, timers and their retentivity</b> |                                          |
| S7 counter                                    |                                          |
| • Number                                      | 256                                      |
| • Retentivity                                 |                                          |
| - adjusted                                    | Yes                                      |
| - lower limit                                 | 0                                        |
| - upper limit                                 | 255                                      |
| - preset                                      | Z 0 to Z 7                               |
| • Counting range                              |                                          |
| - adjusted                                    | Yes                                      |
| - lower limit                                 | 0                                        |
| - upper limit                                 | 999                                      |
| IEC counter                                   |                                          |
| • Type                                        | SFB                                      |
| • Number                                      | Unlimited (limited only by RAM capacity) |
| S7 times                                      |                                          |
| • Number                                      | 256                                      |
| • Retentivity                                 |                                          |
| - adjusted                                    | Yes                                      |
| - lower limit                                 | 0                                        |
| - upper limit                                 | 255                                      |
| - preset                                      | No retentivity                           |
| • Time range                                  |                                          |
| - lower limit                                 | 10 ms                                    |
| - upper limit                                 | 9 990 s                                  |
| IEC timer                                     |                                          |
| • Type                                        | SFB                                      |
| • Number                                      | Unlimited (limited only by RAM capacity) |
| <b>Data areas and their retentivity</b>       |                                          |
| Flag                                          |                                          |
| • Number, max.                                | 256 byte                                 |
| • Retentivity available                       | Yes                                      |
| • Retentivity preset                          | MB 0 to MB 15                            |
| • Number of clock memories                    | 8; 1 memory byte                         |
| Data blocks                                   |                                          |
| • Number, max.                                | 1 024; Number range: 1 to 16,000         |
| • Size, max.                                  | 64 Kibyte                                |
| • Retentivity adjustable                      | Yes; via non-retain property on DB       |
| • Retentivity preset                          | Yes                                      |
| Local data                                    |                                          |
| • per priority class, max.                    | 32 768 byte; 2048 byte max. per block    |
| <b>Address area</b>                           |                                          |
| I/O address area                              |                                          |
| • Overall                                     | 2 048 byte                               |
| • Outputs                                     | 2 048 byte                               |
| • of which, distributed                       |                                          |
| - Inputs                                      | 2 048 byte                               |
| - Outputs                                     | 2 048 byte                               |
| Process image                                 |                                          |
| • Inputs, adjustable                          | 2 048 byte                               |
| • Outputs, adjustable                         | 2 048 byte                               |
| • Inputs, preset                              | 128 byte                                 |
| • Outputs, preset                             | 128 byte                                 |

| 6ES7 151-8FB01-0AB0                                       |                                                                                  |
|-----------------------------------------------------------|----------------------------------------------------------------------------------|
| Subprocess images                                         |                                                                                  |
| • Number of subprocess images, max.                       | 1; With PROFINET IO, the length of the user data is limited to 1600 byte         |
| Digital channels                                          |                                                                                  |
| • Inputs                                                  | 16 336                                                                           |
| • Outputs                                                 | 16 336                                                                           |
| • Inputs, of which central                                | 496                                                                              |
| • Outputs, of which central                               | 496                                                                              |
| Analog channels                                           |                                                                                  |
| • Inputs                                                  | 1 021                                                                            |
| • Outputs                                                 | 1 021                                                                            |
| • Inputs, of which central                                | 124                                                                              |
| • Outputs, of which central                               | 124                                                                              |
| <b>Hardware configuration</b>                             |                                                                                  |
| Number of mounting rails that can be used                 | 1                                                                                |
| Max. length of mounting rail                              | Station width: ≤ 1 m or < 2 m                                                    |
| Number of modules per system, max.                        | 63; Centralized                                                                  |
| <b>Time</b>                                               |                                                                                  |
| Clock                                                     |                                                                                  |
| • Hardware clock (real-time clock)                        | Yes                                                                              |
| • Battery-backed and synchronizable                       | Yes                                                                              |
| • Backup time                                             | 6 wk; At 40 °C ambient temperature, typically                                    |
| • Behavior of the clock following POWER-ON                | Clock continues running after POWER OFF                                          |
| • Behavior of the clock following expiry of backup period | Clock continues to run with the time at which the power failure occurred         |
| • Deviation per day, max.                                 | 10 s; Typ.: 2 s                                                                  |
| Runtime meter                                             |                                                                                  |
| • Number                                                  | 1                                                                                |
| • Number/Number range                                     | 0                                                                                |
| • Range of values                                         | 0 to 2 <sup>31</sup> hours (when using SFC 101)                                  |
| • Granularity                                             | 1 hour                                                                           |
| • Retentive                                               | Yes; Must be restarted at each restart                                           |
| Clock synchronization                                     |                                                                                  |
| • supported                                               | Yes                                                                              |
| • to MPI, master                                          | No                                                                               |
| • to MPI, slave                                           | No                                                                               |
| • to DP, master                                           | Yes; with DP master module                                                       |
| • to DP, slave                                            | Yes; with DP master module                                                       |
| • in AS, master                                           | No                                                                               |
| • in AS, slave                                            | No                                                                               |
| • on Ethernet via NTP                                     | Yes; as client                                                                   |
| <b>S7 message functions</b>                               |                                                                                  |
| Number of login stations for message functions, max.      | 12; Depending on the configured connections for PG/OP and S7 basic communication |
| Process diagnostic messages                               | Yes; ALARM_S, ALARM_SC, ALARM_SQ, ALARM_D, ALARM_DQ                              |
| Simultaneously active Alarm-S blocks, max.                | 300                                                                              |

# SIMATIC ET 200 distributed I/O

## ET 200S

### Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

#### Technical specifications (continued)

| 6ES7 151-8FB01-0AB0                               |                                                                                                       |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Test commissioning functions</b>               |                                                                                                       |
| Status/control                                    |                                                                                                       |
| • Status/control variable                         | Yes                                                                                                   |
| • Variables                                       | Inputs, outputs, memory bits, DB, times, counters                                                     |
| • Number of variables, max.                       | 30                                                                                                    |
| • of which status variables, max.                 | 30                                                                                                    |
| • of which control variables, max.                | 14                                                                                                    |
| Forcing                                           |                                                                                                       |
| • Forcing                                         | Yes                                                                                                   |
| Status block                                      | Yes; up to 2 simultaneously                                                                           |
| Single step                                       | Yes                                                                                                   |
| Number of breakpoints                             | 4                                                                                                     |
| Diagnostic buffer                                 |                                                                                                       |
| • Present                                         | Yes                                                                                                   |
| • Number of entries, max.                         | 500                                                                                                   |
| - adjusted                                        | No                                                                                                    |
| - of which powerfail-proof                        | 100; Only the last 100 entries are retained                                                           |
| <b>Monitoring functions</b>                       |                                                                                                       |
| Status LEDs                                       | Yes                                                                                                   |
| <b>Communication functions</b>                    |                                                                                                       |
| PG/OP communication                               | Yes                                                                                                   |
| Data record routing                               | Yes; with DP master module                                                                            |
| Routing                                           | Yes; with DP master module                                                                            |
| Global data communication                         |                                                                                                       |
| • supported                                       | No                                                                                                    |
| S7 basic communication                            |                                                                                                       |
| • supported                                       | Yes; I blocks                                                                                         |
| • User data per job, max.                         | 76 byte                                                                                               |
| • User data per job (of which consistent), max.   | 76 byte                                                                                               |
| S7 communication                                  |                                                                                                       |
| • supported                                       | Yes                                                                                                   |
| • as server                                       | Yes                                                                                                   |
| • as client                                       | Yes; via integrated PN interface and loadable FBs                                                     |
| • User data per job, max.                         | See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication) |
| Web server                                        |                                                                                                       |
| • supported                                       | Yes                                                                                                   |
| • Number of HTTP clients                          | 5                                                                                                     |
| • User-defined websites                           | Yes                                                                                                   |
| Open IE communication                             |                                                                                                       |
| • TCP/IP                                          | Yes; via integrated PROFINET interface and loadable FBs                                               |
| - Number of connections, max.                     | 8                                                                                                     |
| - Data length for connection type 01H, max.       | 1 460 byte                                                                                            |
| - Data length for connection type 11H, max.       | 32 768 byte                                                                                           |
| - Several passive connections per port, supported | Yes                                                                                                   |
| • ISO-on-TCP (RFC1006)                            | Yes; via integrated PROFINET interface and loadable FBs                                               |
| - Number of connections, max.                     | 8                                                                                                     |
| - Data length, max.                               | 32 768 byte                                                                                           |

| 6ES7 151-8FB01-0AB0                                                  |                                                         |
|----------------------------------------------------------------------|---------------------------------------------------------|
| Open IE communication                                                |                                                         |
| • UDP                                                                | Yes; via integrated PROFINET interface and loadable FBs |
| - Number of connections, max.                                        | 8                                                       |
| - Data length, max.                                                  | 1 472 byte                                              |
| Number of connections                                                |                                                         |
| • overall                                                            | 12                                                      |
| • usable for PG communication                                        | 11                                                      |
| - reserved for PG communication                                      | 1                                                       |
| - Adjustable for PG communication, min.                              | 1                                                       |
| • usable for OP communication                                        | 11                                                      |
| - reserved for OP communication                                      | 1                                                       |
| - adjustable for OP communication, min.                              | 1                                                       |
| • usable for S7 basic communication                                  | 10                                                      |
| - Reserved for S7 basic communication                                | 0                                                       |
| - adjustable for S7 basic communication, min.                        | 0                                                       |
| • usable for S7 communication                                        | 10; with loadable FBs                                   |
| - Adjustable for S7 communication, max.                              | 10                                                      |
| • Max. total number of instances                                     | 32                                                      |
| • usable for routing                                                 | 4; max.                                                 |
| PROFINET CBA (at set setpoint communication load)                    |                                                         |
| • Setpoint for the CPU communication load                            | 50 %                                                    |
| • Number of remote interconnection partners                          | 32                                                      |
| • Number of functions, master/slave                                  | 30                                                      |
| • Total of all Master/Slave connections                              | 1 000                                                   |
| • Data length of all incoming connections master/slave, max.         | 4 000 byte                                              |
| • Data length of all outgoing connections master/slave, max.         | 4 000 byte                                              |
| • Number of device-internal and PROFIBUS interconnections            | 500                                                     |
| • Data length of device-internal und PROFIBUS interconnections, max. | 4 000 byte                                              |
| • Data length per connection, max.                                   | 1 400 byte                                              |
| • Remote interconnections with acyclic transmission                  |                                                         |
| - Sampling frequency: Sampling time, min.                            | 500 ms                                                  |
| - Number of incoming interconnections                                | 100                                                     |
| - Number of outgoing interconnections                                | 100                                                     |
| - Data length of all incoming interconnections, max.                 | 2 000 byte                                              |
| - Data length of all outgoing interconnections, max.                 | 2 000 byte                                              |
| - Data length per connection, max.                                   | 1 400 byte                                              |
| • Remote interconnections with cyclic transmission                   |                                                         |
| - Transmission frequency: Transmission interval, min.                | 1 ms                                                    |

| 6ES7 151-8FB01-0AB0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Services <ul style="list-style-type: none"> <li>- Isochronous mode</li> <li>- Open IE communication</li> </ul> </li> <li>• Transmission rate, max.</li> <li>• Number of connectable IO devices, max.</li> <li>• Max. number of connectable IO devices for RT <ul style="list-style-type: none"> <li>- of which in line, max.</li> </ul> </li> <li>• Number of IO devices with IRT and the option "high flexibility" <ul style="list-style-type: none"> <li>- of which in line, max.</li> </ul> </li> <li>• Number of IO devices with IRT and the option "high performance", max. <ul style="list-style-type: none"> <li>- of which in line, max.</li> </ul> </li> <li>• IRT, supported <ul style="list-style-type: none"> <li>- Shared device, supported</li> </ul> </li> <li>• Prioritized startup supported <ul style="list-style-type: none"> <li>- Number of IO devices, max.</li> </ul> </li> <li>• Activation/deactivation of IO devices <ul style="list-style-type: none"> <li>- Number of IO devices that can be simultaneously activated/deactivated, max.</li> </ul> </li> <li>• IO devices changing during operation (partner ports), supported <ul style="list-style-type: none"> <li>- Max. number of IO devices per tool</li> </ul> </li> <li>• Device replacement without swap medium</li> <li>• Send cycles</li> <li>• Updating time</li> <li>• Updating times</li> <li>• Address area <ul style="list-style-type: none"> <li>- Inputs, max.</li> <li>- Outputs, max.</li> </ul> </li> <li>• User data per address area, max. <ul style="list-style-type: none"> <li>- User data consistency, max.</li> </ul> </li> </ul> | <p>Yes; OB 61; only for PROFINET IO<br/>Yes; Via TCP/IP, ISO on TCP, and UDP</p> <p>100 Mbit/s; full duplex</p> <p>128</p> <p>128</p> <p>128</p> <p>61</p> <p>64</p> <p>64</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>32</p> <p>Yes</p> <p>8</p> <p>Yes</p> <p>8</p> <p>Yes</p> <p>250 µs, 500 µs, 1 ms; 2 ms, 4 ms (not in the case of IRT with "high flexibility" option)</p> <p>Minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the number of configured user data.</p> <p>250 µs to 512 ms (depends on operating mode; for more details, refer to Operating Instructions, "Interface Module IM151-8 PN/DP CPU")</p> <p>2 kbyte</p> <p>2 kbyte</p> <p>1 024 byte; with PROFINET I/O</p> |
| PROFINET IO device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• Services <ul style="list-style-type: none"> <li>- PG/OP communication</li> <li>- Routing</li> <li>- S7 communication</li> <li>- Isochronous mode</li> <li>- Open IE communication</li> <li>- IRT, supported</li> <li>- PROFinergy, supported</li> <li>- Shared device, supported</li> <li>- Number of IO controllers with shared device, max.</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>Yes</p> <p>Yes</p> <p>Yes; With loadable FBs</p> <p>No</p> <p>Yes; Via TCP/IP, ISO on TCP, UDP</p> <p>Yes</p> <p>Yes; With SFB 73 / 74 prepared for loadable PROFinergy standard FB for I-Device</p> <p>Yes</p> <p>2</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

# SIMATIC ET 200 distributed I/O

## ET 200S

### Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

#### Technical specifications (continued)

| 6ES7 151-8FB01-0AB0                                                          |                                                                                             |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| • Transfer memory<br>- Inputs, max.                                          | 1 440 byte; Per IO controller with shared device                                            |
| - Outputs, max.                                                              | 1 440 byte; Per IO controller with shared device                                            |
| • Submodules<br>- Number, max.                                               | 64                                                                                          |
| - User data per submodule, max.                                              | 1 024 byte                                                                                  |
| PROFINET CBA                                                                 |                                                                                             |
| • acyclic transmission                                                       | Yes                                                                                         |
| • cyclic transmission                                                        | Yes                                                                                         |
| Open IE communication                                                        |                                                                                             |
| • Open IE communication, supported                                           | Yes; Via TCP/IP, ISO on TCP, and UDP                                                        |
| • Number of connections, max.                                                | 8                                                                                           |
| • Local port numbers used at the system end                                  | 0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535 |
| <b>2nd interface</b>                                                         |                                                                                             |
| Type of interface                                                            | External interface via master module 6ES7138-4HA00-0AB0                                     |
| Physics                                                                      | RS 485                                                                                      |
| Isolated                                                                     | Yes                                                                                         |
| Power supply to interface (15 to 30 V DC), max.                              | No                                                                                          |
| Functionality                                                                |                                                                                             |
| • MPI                                                                        | No                                                                                          |
| • DP master                                                                  | Yes                                                                                         |
| • DP slave                                                                   | No                                                                                          |
| • PROFINET IO controller                                                     | No                                                                                          |
| • PROFINET IO device                                                         | No                                                                                          |
| • PROFINET CBA                                                               | No                                                                                          |
| • Open IE communication                                                      | No                                                                                          |
| • Web server                                                                 | No                                                                                          |
| DP master                                                                    |                                                                                             |
| • Services                                                                   |                                                                                             |
| - PG/OP communication                                                        | Yes                                                                                         |
| - Routing                                                                    | Yes                                                                                         |
| - Global data communication                                                  | No                                                                                          |
| - S7 basic communication                                                     | Yes; I blocks only                                                                          |
| - S7 communication                                                           | Yes                                                                                         |
| - S7 communication, as client                                                | No                                                                                          |
| - S7 communication, as server                                                | Yes                                                                                         |
| - Equidistance mode support                                                  | Yes                                                                                         |
| - Isochronous mode                                                           | No                                                                                          |
| - SYNC/FREEZE                                                                | Yes                                                                                         |
| - Activation/deactivation of DP slaves                                       | Yes                                                                                         |
| - Number of DP slaves that can be simultaneously activated/deactivated, max. | 8                                                                                           |
| - Direct data exchange (slave-to-slave communication)                        | Yes                                                                                         |
| - DPV1                                                                       | Yes                                                                                         |
| • Transmission rate, max.                                                    | 12 Mbit/s                                                                                   |
| • Number of DP slaves, max.                                                  | 32; Per station                                                                             |
| • Address area                                                               |                                                                                             |
| - Inputs, max.                                                               | 2 048 byte                                                                                  |
| - Outputs, max.                                                              | 2 048 byte                                                                                  |

| 6ES7 151-8FB01-0AB0                                  |                                        |
|------------------------------------------------------|----------------------------------------|
| • User data per DP slave<br>- Inputs, max.           | 244 byte                               |
| - Outputs, max.                                      | 244 byte                               |
| <b>Isochronous mode</b>                              |                                        |
| Isochronous mode                                     | No                                     |
| <b>Programming</b>                                   |                                        |
| Programming language                                 |                                        |
| • STEP 7                                             | Yes; V5.5 or higher                    |
| • LAD                                                | Yes                                    |
| • FBD                                                | Yes                                    |
| • STL                                                | Yes                                    |
| • SCL                                                | Yes; optional                          |
| • CFC                                                | Yes; optional                          |
| • GRAPH                                              | Yes; optional                          |
| • HiGraph®                                           | Yes; optional                          |
| Command set                                          | See instruction list                   |
| Nesting levels                                       | 8                                      |
| Know-how protection                                  |                                        |
| • User program protection/ password protection       | Yes                                    |
| • Block encryption                                   | Yes; with S7 block Privacy             |
| System functions (SFC)                               | See instruction list                   |
| System function blocks (SFB)                         | See instruction list                   |
| <b>Alarms/diagnostics/status information</b>         |                                        |
| Alarms                                               |                                        |
| • Alarms                                             | Yes                                    |
| Diagnostics                                          |                                        |
| • Diagnostic functions                               | Yes                                    |
| Diagnostic indication LED                            |                                        |
| • Bus activity PROFINET P1-LINK (green)              | Yes                                    |
| • Bus activity PROFINET P2-LINK (green)              | Yes                                    |
| • Bus activity PROFINET P3-LINK (green)              | Yes                                    |
| • Bus error (red)                                    | Yes                                    |
| • Maintenance information MT (yellow)                | Yes                                    |
| • Group error SF (red)                               | Yes                                    |
| • Monitoring 24 V voltage supply ON (green)          | Yes                                    |
| <b>Isolation</b>                                     |                                        |
| Isolation checked with                               | 500 V DC                               |
| <b>Galvanic isolation</b>                            |                                        |
| between PROFIBUS DP and all other circuit components | Yes                                    |
| <b>Permissible potential difference</b>              |                                        |
| between different circuits                           | 75 V DC / 60 V AC                      |
| <b>Dimensions and weight</b>                         |                                        |
| Dimensions                                           |                                        |
| • Width                                              | 120 mm; DP master module: 35 mm        |
| • Height                                             | 119.5 mm                               |
| • Depth                                              | 75 mm                                  |
| Weight                                               |                                        |
| • Weight, approx.                                    | 320 g; DP master module: approx. 100 g |

## Technical specifications (continued)

| 6ES7 151-8FB00-0AB0                                                                                                      |                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product type designation</b>                                                                                          | IM151-8F PN/DP                                                                                                                                                                                                                                                                                                |
| <b>Product version</b><br>Associated programming package                                                                 | STEP7 V 5.4 SP4 or higher,<br>Distributed Safety V5.4 SP4 or higher                                                                                                                                                                                                                                           |
| <b>Supply voltages</b><br>Rated value<br>• permissible range, lower limit (DC)                                           | 20.4 V                                                                                                                                                                                                                                                                                                        |
| External protection for supply cables (recommendation)                                                                   | 24 V DC/16 A miniature circuit breaker with type B and C tripping characteristics.<br>Note: The 24 V DC/16 A miniature circuit breaker with type B tripping characteristics trips before the device protection fuse.<br>The 24 V DC/16 A miniature circuit breaker with type C tripping characteristics trips |
| Mains buffering<br>• Mains/voltage failure stored energy time                                                            | 5 ms                                                                                                                                                                                                                                                                                                          |
| <b>Current consumption</b><br>Inrush current, max.                                                                       | 1.8 A; typ.                                                                                                                                                                                                                                                                                                   |
| $I^2t$                                                                                                                   | 0.21 A <sup>2</sup> ·s                                                                                                                                                                                                                                                                                        |
| Current output to backplane bus (DC 5 V), max.                                                                           | 700 mA                                                                                                                                                                                                                                                                                                        |
| from supply voltage 1L+, max.                                                                                            | 380 mA; 460 mA with DP master module                                                                                                                                                                                                                                                                          |
| <b>Power losses</b><br>Power loss, typ.                                                                                  | 5.5 W                                                                                                                                                                                                                                                                                                         |
| <b>Memory</b><br>Work memory<br>• integrated<br><br>• expandable<br>• Size of retentive memory for retentive data blocks | 192 Kibyte; For program and data<br>No<br>64 kbyte                                                                                                                                                                                                                                                            |
| Load memory<br>• pluggable (MMC)<br>• pluggable (MMC), max.                                                              | Yes<br>8 Mbyte                                                                                                                                                                                                                                                                                                |
| <b>CPU-blocks</b><br>Number of blocks (total)                                                                            | 1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.                                                                                                                                                                                                                 |
| DB<br>• Number, max.<br>• Size, max.                                                                                     | 511; Number range: 1 to 511<br>64 Kibyte                                                                                                                                                                                                                                                                      |
| FB<br>• Number, max.<br>• Size, max.                                                                                     | 1 024; Number range: 0 to 2047<br>64 Kibyte                                                                                                                                                                                                                                                                   |
| FC<br>• Number, max.<br>• Size, max.                                                                                     | 1 024; Number range: 0 to 2047<br>64 Kibyte                                                                                                                                                                                                                                                                   |
| OB<br>• Size, max.                                                                                                       | 64 Kibyte                                                                                                                                                                                                                                                                                                     |
| Nesting depth<br>• per priority class<br>• additional within an error OB                                                 | 16<br>4                                                                                                                                                                                                                                                                                                       |

| 6ES7 151-8FB00-0AB0                                                                                                                                                                                                      |                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>CPU processing times</b><br>for bit operations, min.                                                                                                                                                                  | 0.1 µs                                                                                |
| for word operations, min.                                                                                                                                                                                                | 0.2 µs                                                                                |
| for fixed point arithmetic, min.                                                                                                                                                                                         | 2 µs                                                                                  |
| for floating point arithmetic, min.                                                                                                                                                                                      | 3 µs                                                                                  |
| <b>Counters, timers and their retentivity</b><br>S7 counter<br>• Number<br>• Retentivity<br>- adjusted<br>- lower limit<br>- upper limit<br>- preset<br>• Counting range<br>- adjusted<br>- lower limit<br>- upper limit | 256<br><br>Yes<br>0<br>255<br>Z 0 to Z 7<br><br>Yes<br>0<br>999                       |
| IEC counter<br>• Type<br>• Number                                                                                                                                                                                        | SFB<br>Unlimited (limited only by RAM capacity)                                       |
| S7 times<br>• Number<br>• Retentivity<br>- adjusted<br>- lower limit<br>- upper limit<br>- preset<br>• Time range<br>- lower limit<br>- upper limit                                                                      | 256<br><br>Yes<br>0<br>255<br>No retentivity<br><br>10 ms<br>9 990 s                  |
| IEC timer<br>• Type<br>• Number                                                                                                                                                                                          | SFB<br>Unlimited (limited only by RAM capacity)                                       |
| <b>Data areas and their retentivity</b><br>Flag<br>• Number, max.<br>• Retentivity available<br>• Retentivity preset<br>• Number of clock memories                                                                       | 256 byte<br>Yes<br>MB 0 to MB 15<br>8; 1 memory byte                                  |
| Data blocks<br>• Number, max.<br>• Size, max.<br>• Retentivity adjustable<br>• Retentivity preset                                                                                                                        | 511; Number range: 1 to 511<br>64 Kibyte<br>Yes; via non-retain property on DB<br>Yes |
| Local data<br>• per priority class, max.                                                                                                                                                                                 | 510 byte; per priority class                                                          |
| <b>Address area</b><br>I/O address area<br>• Overall<br>• Outputs<br>• of which, distributed<br>- Inputs<br>- Outputs                                                                                                    | 2 048 byte<br>2 048 byte<br><br>2 048 byte<br>2 048 byte                              |



# SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules with fail-safe CPU  
IM 151-8 F PN/DP CPU

### Technical specifications (continued)

| 6ES7 151-8FB00-0AB0                                       |                                                                                  |
|-----------------------------------------------------------|----------------------------------------------------------------------------------|
| Process image                                             |                                                                                  |
| • Inputs, adjustable                                      | 2 048 byte                                                                       |
| • Outputs, adjustable                                     | 2 048 byte                                                                       |
| • Inputs, preset                                          | 128 byte                                                                         |
| • Outputs, preset                                         | 128 byte                                                                         |
| Subprocess images                                         |                                                                                  |
| • Number of subprocess images, max.                       | None                                                                             |
| Digital channels                                          |                                                                                  |
| • Inputs                                                  | 16 336                                                                           |
| • Outputs                                                 | 16 336                                                                           |
| • Inputs, of which central                                | 496                                                                              |
| • Outputs, of which central                               | 496                                                                              |
| Analog channels                                           |                                                                                  |
| • Inputs                                                  | 1 021                                                                            |
| • Outputs                                                 | 1 021                                                                            |
| • Inputs, of which central                                | 124                                                                              |
| • Outputs, of which central                               | 124                                                                              |
| <b>Hardware configuration</b>                             |                                                                                  |
| Number of mounting rails that can be used                 | 1                                                                                |
| Max. length of mounting rail                              | Station width: ≤ 1 m or < 2 m                                                    |
| Number of modules per system, max.                        | 63; Centralized                                                                  |
| <b>Time</b>                                               |                                                                                  |
| Clock                                                     |                                                                                  |
| • Hardware clock (real-time clock)                        | Yes                                                                              |
| • Battery-backed and synchro-nizable                      | Yes                                                                              |
| • Backup time                                             | 6 wk; At 40 °C ambient temperature, typically                                    |
| • Behavior of the clock following expiry of backup period | Clock continues to run with the time at which the power failure occurred         |
| • Deviation per day, max.                                 | 10 s                                                                             |
| Runtime meter                                             |                                                                                  |
| • Number                                                  | 1                                                                                |
| • Number/Number range                                     | 0                                                                                |
| • Range of values                                         | 0 to 2 <sup>31</sup> hours (when using SFC 101)                                  |
| • Granularity                                             | 1 hour                                                                           |
| • Retentive                                               | Yes; must be restarted at each restart                                           |
| Clock synchronization                                     |                                                                                  |
| • supported                                               | Yes                                                                              |
| • to MPI, master                                          | No                                                                               |
| • to MPI, slave                                           | No                                                                               |
| • to DP, master                                           | Yes; with DP master module                                                       |
| • to DP, slave                                            | Yes; with DP master module                                                       |
| • in AS, master                                           | No                                                                               |
| • in AS, slave                                            | No                                                                               |
| • on Ethernet via NTP                                     | Yes; as client                                                                   |
| <b>S7 message functions</b>                               |                                                                                  |
| Number of login stations for message functions, max.      | 12; depending on the configured connections for PG/OP and S7 basic communication |
| Process diagnostic messages                               | Yes; ALARM_S, ALARM_SC, ALARM_SQ, ALARM_D, ALARM_DQ                              |
| Simultaneously active Alarm-S blocks, max.                | 300                                                                              |

| 6ES7 151-8FB00-0AB0                             |                                                         |
|-------------------------------------------------|---------------------------------------------------------|
| <b>Test commissioning functions</b>             |                                                         |
| Status/control                                  |                                                         |
| • Status/control variable                       | Yes                                                     |
| • Variables                                     | Inputs, outputs, memory bits, DB, times, counters       |
| • Number of variables, max.                     | 30                                                      |
| • of which status variables, max.               | 30                                                      |
| • of which control variables, max.              | 14                                                      |
| Forcing                                         |                                                         |
| • Forcing                                       | Yes                                                     |
| Status block                                    | Yes                                                     |
| Single step                                     | Yes                                                     |
| Number of breakpoints                           | 2                                                       |
| Diagnostic buffer                               |                                                         |
| • Present                                       | Yes                                                     |
| • Number of entries, max.                       | 500                                                     |
| - adjusted                                      | No                                                      |
| - of which powerfail-proof                      | 100; only the last 100 entries are retained             |
| <b>Communication functions</b>                  |                                                         |
| PG/OP communication                             | Yes                                                     |
| Data record routing                             | Yes; with DP master module                              |
| Routing                                         | Yes; with DP master module                              |
| Global data communication                       |                                                         |
| • supported                                     | No                                                      |
| S7 basic communication                          |                                                         |
| • supported                                     | Yes; I blocks                                           |
| • User data per job, max.                       | 76 byte                                                 |
| • User data per job (of which consistent), max. | 76 byte                                                 |
| S7 communication                                |                                                         |
| • supported                                     | Yes                                                     |
| • as server                                     | Yes                                                     |
| • as client                                     | Yes; via integrated PN interface and loadable FBs       |
| • User data per job, max.                       | 180 byte                                                |
| • User data per job (of which consistent), max. | 64 byte                                                 |
| S5-compatible communication                     |                                                         |
| • supported                                     | No                                                      |
| Standard communication (FMS)                    |                                                         |
| • supported                                     | No                                                      |
| Web server                                      |                                                         |
| • supported                                     | Yes                                                     |
| • Number of HTTP clients                        | 5                                                       |
| Open IE communication                           |                                                         |
| • TCP/IP                                        | Yes; via integrated PROFINET interface and loadable FBs |
| - Number of connections, max.                   | 8                                                       |
| - Data length for connection type 01H, max.     | 1 460 byte                                              |
| - Data length for connection type 11H, max.     | 8 192 byte                                              |
| • ISO-on-TCP (RFC1006)                          | Yes; via integrated PROFINET interface and loadable FBs |
| - Number of connections, max.                   | 8                                                       |
| - Data length, max.                             | 8 192 byte                                              |

## Technical specifications (continued)

| 6ES7 151-8FB00-0AB0                                                  |                                                         |
|----------------------------------------------------------------------|---------------------------------------------------------|
| • UDP                                                                | Yes; via integrated PROFINET interface and loadable FBs |
| - Number of connections, max.                                        | 8                                                       |
| - Data length, max.                                                  | 1 472 byte                                              |
| Number of connections                                                |                                                         |
| • overall                                                            | 12                                                      |
| • usable for PG communication                                        | 11                                                      |
| - reserved for PG communication                                      | 1                                                       |
| - Adjustable for PG communication, min.                              | 1                                                       |
| • usable for OP communication                                        | 11                                                      |
| - reserved for OP communication                                      | 1                                                       |
| - adjustable for OP communication, min.                              | 1                                                       |
| • usable for S7 basic communication                                  | 10                                                      |
| - Reserved for S7 basic communication                                | 0                                                       |
| - adjustable for S7 basic communication, min.                        | 0                                                       |
| • usable for S7 communication                                        | 10; with loadable FBs                                   |
| - Adjustable for S7 communication, max.                              | 10                                                      |
| • max. total number of instances                                     | 32                                                      |
| • usable for routing                                                 | 4; with DP master module                                |
| PROFINET CBA (at set setpoint communication load)                    |                                                         |
| • Setpoint for the CPU communication load                            | 50 %                                                    |
| • Number of remote interconnection partners                          | 32                                                      |
| • Number of functions, master/slave                                  | 30                                                      |
| • Total of all Master/Slave connections                              | 1 000                                                   |
| • Data length of all incoming connections master/slave, max.         | 4 000 byte                                              |
| • Data length of all outgoing connections master/slave, max.         | 4 000 byte                                              |
| • Number of device-internal and PROFIBUS interconnections            | 500                                                     |
| • Data length of device-internal und PROFIBUS interconnections, max. | 4 000 byte                                              |
| • Data length per connection, max.                                   | 1 400 byte                                              |
| • Remote interconnections with acyclic transmission                  |                                                         |
| - Sampling frequency: Sampling time, min.                            | 500 ms                                                  |
| - Number of incoming interconnections                                | 100                                                     |
| - Number of outgoing interconnections                                | 100                                                     |
| - Data length of all incoming interconnections, max.                 | 2 000 byte                                              |
| - Data length of all outgoing interconnections, max.                 | 2 000 byte                                              |
| - Data length per connection, max.                                   | 1 400 byte                                              |
| • Remote interconnections with cyclic transmission                   |                                                         |
| - Transmission frequency: transmission interval, min.                | 1 ms                                                    |

| 6ES7 151-8FB00-0AB0                                                  |                                      |
|----------------------------------------------------------------------|--------------------------------------|
| • Remote interconnections with cyclic transmission                   |                                      |
| - Number of incoming interconnections                                | 200                                  |
| - Number of outgoing interconnections                                | 200                                  |
| - Data length of all incoming interconnections, max.                 | 2 000 byte                           |
| - Data length of all outgoing interconnections, max.                 | 2 000 byte                           |
| - Data length per connection, max.                                   | 250 byte                             |
| • HMI variables via PROFINET (acyclic)                               |                                      |
| - Number of stations that can log on for HMI variables (PN OPC/iMap) | 3; 2x PN OPC/1x iMap                 |
| - HMI variable updating                                              | 500 ms                               |
| - Number of HMI variables                                            | 200                                  |
| - Data length of all HMI variables, max.                             | 2 000 byte                           |
| • PROFIBUS proxy functionality                                       |                                      |
| - supported                                                          | Yes                                  |
| - Number of linked PROFIBUS devices                                  | 16                                   |
| - Data length per connection, max.                                   | 240 byte; Slave-dependent            |
| <b>1st interface</b>                                                 |                                      |
| Type of interface                                                    | PROFINET                             |
| Physics                                                              | Ethernet                             |
| Isolated                                                             | Yes                                  |
| Integrated switch                                                    | Yes                                  |
| Number of ports                                                      | 3; RJ45                              |
| Automatic detection of transmission speed                            | Yes                                  |
| Autonegotiation                                                      | Yes                                  |
| Autocrossing                                                         | Yes                                  |
| Functionality                                                        |                                      |
| • MPI                                                                | No                                   |
| • DP master                                                          | No                                   |
| • DP slave                                                           | No                                   |
| • PROFINET IO device                                                 | No                                   |
| • PROFINET IO controller                                             | Yes                                  |
| • PROFINET CBA                                                       | Yes                                  |
| • Open IE communication                                              | Yes                                  |
| • Web server                                                         |                                      |
| - Number of HTTP clients                                             | 5                                    |
| • Point-to-point connection                                          | No                                   |
| PROFINET IO controller                                               |                                      |
| • Services                                                           |                                      |
| - PG/OP communication                                                | Yes                                  |
| - Routing                                                            | Yes; with DP master module           |
| - S7 communication                                                   | Yes; with loadable FBs               |
| - Isochronous mode                                                   | No                                   |
| - Open IE communication                                              | Yes; via TCP/IP, ISO on TCP, and UDP |
| • Transmission rate, max.                                            | 100 Mbit/s; full duplex              |
| • Number of connectable IO devices, max.                             | 128                                  |
| • Max. number of connectable IO devices for RT                       | 128                                  |
| - of which in line, max.                                             | 128                                  |



# SIMATIC ET 200 distributed I/O

## ET 200S

### Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

#### Technical specifications (continued)

| 6ES7 151-8FB00-0AB0                                                           |                                                                                                                                                   |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| PROFINET IO controller                                                        |                                                                                                                                                   |
| • Number of IO devices with IRT and the option "high flexibility"             | 128                                                                                                                                               |
| - of which in line, max.                                                      | 61                                                                                                                                                |
| • IRT, supported                                                              | Yes                                                                                                                                               |
| • Prioritized startup supported                                               | Yes                                                                                                                                               |
| - Number of IO devices, max.                                                  | 32                                                                                                                                                |
| • Activation/deactivation of IO devices                                       | Yes                                                                                                                                               |
| - Number of IO devices that can be simultaneously activated/deactivated, max. | 8                                                                                                                                                 |
| • IO devices changing during operation (partner ports), supported             | Yes                                                                                                                                               |
| - Max. number of IO devices per tool                                          | 8                                                                                                                                                 |
| • Device replacement without swap medium                                      | Yes                                                                                                                                               |
| • Send cycles                                                                 | Adjustable: 250 µs, 500 µs and 1 ms                                                                                                               |
| • Updating time                                                               | Minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the number of configured user data units. |
| • Updating times                                                              | 250 µs - 128 ms (at signal cycle 250 µs); 500 µs - 256 ms (at signal cycle 500 µs); 1 ms - 512 ms (at signal cycle 1 ms)                          |
| • Address area                                                                |                                                                                                                                                   |
| - Inputs, max.                                                                | 2 kbyte                                                                                                                                           |
| - Outputs, max.                                                               | 2 kbyte                                                                                                                                           |
| • User data per address area, max.                                            |                                                                                                                                                   |
| - User data consistency, max.                                                 | 254 byte; with PROFINET I/O                                                                                                                       |
| PROFINET CBA                                                                  |                                                                                                                                                   |
| • acyclic transmission                                                        | Yes                                                                                                                                               |
| • cyclic transmission                                                         | Yes                                                                                                                                               |
| Open IE communication                                                         |                                                                                                                                                   |
| • Open IE communication, supported                                            | Yes; Via TCP/IP, ISO on TCP, and UDP                                                                                                              |
| • Number of connections, max.                                                 | 8                                                                                                                                                 |
| • Local port numbers used at the system end                                   | 0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535                                                       |
| <b>2nd interface</b>                                                          |                                                                                                                                                   |
| Type of interface                                                             | External interface via master module 6ES7138-4HA00-0AB0                                                                                           |
| Physics                                                                       | RS 485                                                                                                                                            |
| Isolated                                                                      | Yes                                                                                                                                               |
| Power supply to interface (15 to 30 V DC), max.                               | No                                                                                                                                                |
| Functionality                                                                 |                                                                                                                                                   |
| • MPI                                                                         | No                                                                                                                                                |
| • DP master                                                                   | Yes                                                                                                                                               |
| • DP slave                                                                    | No                                                                                                                                                |
| • PROFINET IO controller                                                      | No                                                                                                                                                |
| • PROFINET IO device                                                          | No                                                                                                                                                |
| • PROFINET CBA                                                                | No                                                                                                                                                |
| • Open IE communication                                                       | No                                                                                                                                                |
| • Web server                                                                  | No                                                                                                                                                |
| • Local Operating Network                                                     | No                                                                                                                                                |

| 6ES7 151-8FB00-0AB0                                   |                                                       |
|-------------------------------------------------------|-------------------------------------------------------|
| DP master                                             |                                                       |
| • Number of connections, max.                         | 12; Notice: 12 connections per CPU, not per interface |
| • Services                                            |                                                       |
| - PG/OP communication                                 | Yes                                                   |
| - Routing                                             | Yes                                                   |
| - Global data communication                           | No                                                    |
| - S7 basic communication                              | Yes; I blocks only                                    |
| - S7 communication                                    | Yes                                                   |
| - S7 communication, as client                         | No                                                    |
| - S7 communication, as server                         | Yes                                                   |
| - Equidistance mode support                           | Yes                                                   |
| - Isochronous mode                                    | No                                                    |
| - SYNC/FREEZE                                         | Yes                                                   |
| - Activation/deactivation of DP slaves                | Yes                                                   |
| - Direct data exchange (slave-to-slave communication) | Yes                                                   |
| - DPV1                                                | Yes                                                   |
| • Transmission rate, max.                             | 12 Mbit/s                                             |
| • Number of DP slaves, max.                           | 32; Per station                                       |
| • Address area                                        |                                                       |
| - Inputs, max.                                        | 2 048 byte                                            |
| - Outputs, max.                                       | 2 048 byte                                            |
| • User data per DP slave                              |                                                       |
| - Inputs, max.                                        | 244 byte                                              |
| - Outputs, max.                                       | 244 byte                                              |
| <b>Isochronous mode</b>                               |                                                       |
| Isochronous mode                                      | No                                                    |
| <b>Programming</b>                                    |                                                       |
| Programming language                                  |                                                       |
| • STEP 7                                              | Yes; V5.4 SP4                                         |
| • LAD                                                 | Yes                                                   |
| • FBD                                                 | Yes                                                   |
| • STL                                                 | Yes                                                   |
| • SCL                                                 | Yes; optional                                         |
| • CFC                                                 | Yes; optional                                         |
| • GRAPH                                               | Yes; optional                                         |
| • HiGraph®                                            | Yes; optional                                         |
| Command set                                           | See instruction list                                  |
| Nesting levels                                        | 8                                                     |
| Know-how protection                                   |                                                       |
| • User program protection/ password protection        | Yes                                                   |
| System functions (SFC)                                | See instruction list                                  |
| System function blocks (SFB)                          | See instruction list                                  |
| <b>Alarms/diagnostics/status information</b>          |                                                       |
| Alarms                                                |                                                       |
| • Alarms                                              | Yes                                                   |
| Diagnostics                                           |                                                       |
| • Diagnostic functions                                | Yes                                                   |

**Technical specifications** (continued)

| 6ES7 151-8FB00-0AB0                         |          | 6ES7 151-8FB00-0AB0                                     |                                        |
|---------------------------------------------|----------|---------------------------------------------------------|----------------------------------------|
| Diagnostic indication LED                   |          | <b>Galvanic isolation</b>                               |                                        |
| • Bus activity PROFINET P1-LINK (green)     | Yes      | between load voltage and all other switching components | Yes                                    |
| • Bus activity PROFINET P2-LINK (green)     | Yes      | between PROFIBUS DP and all other circuit components    | Yes                                    |
| • Bus activity PROFINET P3-LINK (green)     | Yes      | <b>Permissible potential difference</b>                 |                                        |
| • Bus error (red)                           | Yes      | between different circuits                              | 75 V DC / 60 V AC                      |
| • Maintenance information MT (yellow)       | Yes      | <b>Dimensions and weight</b>                            |                                        |
| • Group error SF (red)                      | Yes      | Dimensions                                              |                                        |
| • Monitoring 24 V voltage supply ON (green) | Yes      | • Width                                                 | 120 mm; DP master module: 35 mm        |
| <b>Isolation</b>                            |          | • Height                                                | 119.5 mm                               |
| Isolation checked with                      | 500 V DC | • Depth                                                 | 75 mm                                  |
|                                             |          | Weight                                                  |                                        |
|                                             |          | • Weight, approx.                                       | 320 g; DP master module: approx. 100 g |

# SIMATIC ET 200 distributed I/O

## ET 200S

### Interface modules with fail-safe CPU IM 151-8 F PN/DP CPU

| Ordering data                                                                                                                                                                                                                                                 | Order No.                                                                              | Order No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IM 151-8F PN/DP CPU interface module (256 K)</b><br>Including termination module                                                                                                                                                                           | <b>6ES7 151-8FB01-0AB0</b>                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Distributed Safety V5.4 programming tool</b><br><br>Task: Software for configuring fail-safe application programs for SIMATIC S7-300F, S7-400F, ET 200S<br><br>Requirements: STEP 7 V5.3 SP3 and higher<br><br>Floating license<br>Software Update Service |                                                                                        | <b>Label sheets DIN A4 (10 units)</b><br>Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules<br>• petrol<br>• red<br>• yellow<br>• light beige<br><br><b>ET 200S distributed I/O system manuals</b><br><br>are available on the Internet as PDF files:<br><a href="http://www.siemens.com/simatic-docu">www.siemens.com/simatic-docu</a><br><br><b>Termination module</b><br>as spare part for ET 200S<br><br><b>SIMATIC S5, 35 mm DIN rail</b><br>• Length: 483 mm for 19" cabinets<br>• Length: 530 mm for 600 mm cabinets<br>• Length: 830 mm for 900 mm cabinets<br>• 2 m long<br><br><b>Industrial Ethernet FC RJ45 Plug 180</b><br><br>RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet<br>• 1 unit<br>• 10 units<br>• 50 units<br><br><b>Industrial Ethernet FastConnect installation cables</b><br>• Fast Connect standard cable<br>• Fast Connect trailing cable<br>• Fast Connect marine cable<br><br><b>Industrial Ethernet FastConnect stripping tool</b> |
|                                                                                                                                                                                                                                                               | <b>6ES7 833-1FC02-0YA5</b><br><b>6ES7 833-1FC00-0YX2</b><br><b>6ES7 833-1FC02-0YE5</b> | <b>6ES7 193-4BH00-0AA0</b><br><b>6ES7 193-4BD00-0AA0</b><br><b>6ES7 193-4BB00-0AA0</b><br><b>6ES7 193-4BA00-0AA0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Distributed Safety Upgrade</b><br>From V5.3 to V5.4; Floating license for 1 user                                                                                                                                                                           |                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Accessories</b>                                                                                                                                                                                                                                            |                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>MMC 64 KB <sup>1)</sup></b><br>for program backup                                                                                                                                                                                                          | <b>6ES7 953-8LF20-0AA0</b>                                                             | <b>6ES7 193-4JA00-0AA0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>MMC 128 KB <sup>1)</sup></b><br>for program backup                                                                                                                                                                                                         | <b>6ES7 953-8LG20-0AA0</b>                                                             | <b>6ES5 710-8MA11</b><br><b>6ES5 710-8MA21</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>MMC 512 KB <sup>1)</sup></b><br>for program backup                                                                                                                                                                                                         | <b>6ES7 953-8LJ20-0AA0</b>                                                             | <b>6ES5 710-8MA31</b><br><b>6ES5 710-8MA41</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>MMC 2 MB <sup>1)</sup></b><br>for program backup and/or firmware update                                                                                                                                                                                    | <b>6ES7 953-8LL20-0AA0</b>                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>MMC 4 MB <sup>1)</sup></b><br>for program backup                                                                                                                                                                                                           | <b>6ES7 953-8LM20-0AA0</b>                                                             | <b>6GK1 901-1BB10-2AA0</b><br><b>6GK1 901-1BB10-2AB0</b><br><b>6GK1 901-1BB10-2AE0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>MMC 8 MB <sup>1)</sup></b><br>for program backup                                                                                                                                                                                                           | <b>6ES7 953-8LP20-0AA0</b>                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>External prommer</b><br>e.g. for MMC with USB interface                                                                                                                                                                                                    | <b>6ES7 792-0AA00-0XA0</b>                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>PG</b><br>with integrated MMC interface                                                                                                                                                                                                                    | On request                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

<sup>1)</sup> An MMC is essential for operating the CPU

## Overview



- Interface module with integrated fail-safe CPU for SIMATIC ET 200S
- With DP/MPI interface
- For configuring a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061 and Cat. 4 according to EN 954-1
- Fail-safe I/O modules can be connected in a distributed configuration through DP master modules (PROFIsafe)
- The fail-safe I/O modules of ET 200S PROFIsafe can be connected in a centralized configuration
- Standard modules can be used for non-safety-relevant applications

**Note:** Micro Memory Card required for operation of CPU.

**Note:**

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

| SIPLUS IM 151-7 F CPU<br>Standard interface module |                                                                                       |
|----------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Order No.</b>                                   | <b>6AG1 151-7FA20-2AB0</b>                                                            |
| <b>Order No. based on</b>                          | <b>6ES7 151-7FA20-0AB0</b>                                                            |
| Ambient temperature range                          | -25 ... +60 °C                                                                        |
| Conformal coating                                  | Coating of the printed circuit boards and the electronic components                   |
| Technical specifications                           | The technical data of the standard product applies except for the ambient conditions. |

**Ambient conditions**

|                   |                                  |
|-------------------|----------------------------------|
| Relative humidity | 5 ... 100%, condensation allowed |
|-------------------|----------------------------------|

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

| Ordering data                                                                                                                                      | Order No.                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| <b>SIPLUS IM 151-7 F CPU interface module</b><br>(extended temperature range and medial exposure)<br>For configuring a fail-safe automation system | <b>6AG1 151-7FA20-2AB0</b>                            |
| <b>Accessories</b>                                                                                                                                 | See SIMATIC IM151-7 F CPU interface module, page 9/31 |

I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200S

SIPLUS interface modules with fail-safe CPU  
SIPLUS IM 151-8 F PN/DP CPU

### Overview



- Interface module for SIPLUS ET 200S with integrated CPU S7-314
- For high-performance control solutions in ET 200S
- Increase in the availability of systems and machines
- PROFINET IO-Controller for up to 128 IO-Devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET I/O-Controller
- PROFINET interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With many communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), Web server and S7 communication (with loadable FBs)
- Fast, simple and uniform programming of a system with modular programs via STEP 7
- Compact SIMATIC micro memory card (MMC)
- Optional PROFIBUS master for 32 PROFIBUS DP slaves (with master interface 6ES7138-4HA00-0AB0)
- Fail-safe IM 151-8F PN/DP CPU PROFIsafe available

SIMATIC Micro Memory Card required for operation of the CPU.

#### Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### SIPLUS IM 151-8 F PN/DP CPU

|                           |                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------|
| Order No.                 | <b>6AG1 151-8FB00-2AB0</b>                                                            |
| Order No. based on        | <b>6ES7 151-8FB00-0AB0</b>                                                            |
| Ambient temperature range | -25 ... +60 °C                                                                        |
| Conformal coating         | Coating of the printed circuit boards and the electronic components                   |
| Technical data            | The technical data of the standard product applies except for the ambient conditions. |

#### Ambient conditions:

|                   |                                        |
|-------------------|----------------------------------------|
| Relative humidity | 5 ... 100%<br>Condensation permissible |
|-------------------|----------------------------------------|

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

#### Ordering data

#### Order No.

|                                                                                                                                        |                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| <b>Interface module SIPLUS IM 151-8F PN/DP CPU</b><br>(extended temperature range and medial exposure)<br>Including termination module | <b>6AG1 151-8FB00-2AB0</b>                                  |
| <b>Accessories</b>                                                                                                                     | See SIMATIC IM 151-8F PN/DP CPU interface module, page 9/42 |

I: Subject to export regulations AL: N and ECCN: EAR99H

## Overview



- Interface module for linking the ET 200S to PROFIBUS DP
- Handles all data exchange with the PROFIBUS DP master
- 6 versions:
  - IM151-1 BASIC (RS485)
  - IM151-1 COMPACT 32DI DC24V (RS485)
  - IM151-1 COMPACT 16DI DC24V / 16DO DC24V/0.5A (RS485)
  - IM151-1 STANDARD (RS485)
  - IM151-1 STANDARD (FO)
  - IM151-1 HIGH FEATURE (RS485)
- Delivery including connection module

The main differences between the IM151-1 versions:

|                                              | IM151-1<br>BASIC | IM151-1 COMPACT            | IM151-1 STANDARD | IM151-1 FO<br>STANDARD | IM151-1<br>HIGH FEATURE                              |
|----------------------------------------------|------------------|----------------------------|------------------|------------------------|------------------------------------------------------|
| Order number 6ES7 151-                       | 1CA00-0AB0       | 1CA00-1BL00<br>1CA00-3BL00 | 1AA05-0AB0       | 1AB05-0AB0             | 1BA02-0AB0                                           |
| Integral I/O                                 | -                | 32 DI<br>16DI / 16 DO      | -                | -                      | -                                                    |
| Maximal number of I/O modules                | 12               | 12                         | 63               | 63                     | 63                                                   |
| Maximum station width                        | 2 m              | 2 m                        | 2 m              | 1 m                    | 2 m                                                  |
| Maximal number of parameters                 | 198 byte         | 218 byte                   | 244 byte         | 244 byte               | 244 byte                                             |
| Maximum address space for inputs and outputs | 88 byte each     | 100 byte each              | 244 byte         | 128 byte               | Depending on the DP master: 244 byte or not relevant |
| Maximum diagnostic length                    | 6 to 43 byte     | 6 to 44 byte               | 6 to 122 byte    | 6 to 64 byte           | 6 to 128 byte                                        |
| Protocol                                     | DP V0            | DP V0                      | DP V0 and DP V1  | DP V0                  | DP V0 and DP V1                                      |
| DP connection type                           | RS485            | RS485                      | RS485            | Fiber-optic cable      | RS485                                                |
| Firmware update                              | No               | No                         | Yes              | No                     | Yes                                                  |
| Option handling                              | No               | No                         | Yes              | Yes                    | Yes                                                  |
| Isochronous mode                             | No               | No                         | No               | No                     | Yes                                                  |
| Maximum address volume per module            | 8 byte           | 8 byte                     | 32 byte          | 8 byte                 | 32 byte                                              |
| Identification data                          | No               | No                         | Yes              | No                     | Yes                                                  |
| Use of fail-safe modules (PROFIsafe)         | No               | No                         | No               | No                     | Yes                                                  |
| I-slave-to-slave communication               | No               | No                         | No               | No                     | Yes                                                  |

## SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules without CPU  
IM 151-1

## Technical specifications

|                                                     | 6ES7 151-1AA05-0AB0                                                                 | 6ES7 151-1AB05-0AB0                                                         | 6ES7 151-1BA02-0AB0 | 6ES7 151-1CA00-0AB0                                                                 |
|-----------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                              |                                                                                     |                                                                             |                     |                                                                                     |
| Supply voltage of electronics 1L+                   |                                                                                     |                                                                             |                     |                                                                                     |
| • Rated value (DC)                                  | 24 V                                                                                | 24 V                                                                        | 24 V                | 24 V                                                                                |
| • Reverse polarity protection                       | Yes                                                                                 | Yes                                                                         | Yes                 | Yes                                                                                 |
| Mains buffering, min.                               | 20 ms                                                                               | 20 ms                                                                       | 20 ms               | No                                                                                  |
| <b>Current consumption</b>                          |                                                                                     |                                                                             |                     |                                                                                     |
| Current output to backplane bus (5 V DC), max.      |                                                                                     | 700 mA                                                                      |                     |                                                                                     |
| from supply voltage 1L+, max.                       | 200 mA                                                                              | 200 mA                                                                      | 200 mA              | 70 mA                                                                               |
| <b>Power losses</b>                                 |                                                                                     |                                                                             |                     |                                                                                     |
| Power loss, typ.                                    | 3.3 W                                                                               | 3.3 W                                                                       | 3.3 W               | 1.5 W                                                                               |
| <b>Address area</b>                                 |                                                                                     |                                                                             |                     |                                                                                     |
| Addressing volume                                   |                                                                                     |                                                                             |                     |                                                                                     |
| • Outputs                                           | 244 byte                                                                            | 244 byte                                                                    | 244 byte            | 88 byte                                                                             |
| • Inputs                                            | 244 byte                                                                            | 244 byte                                                                    | 244 byte            | 88 byte                                                                             |
| <b>Interfaces</b>                                   |                                                                                     |                                                                             |                     |                                                                                     |
| PROFIBUS DP, output current, max.                   | 80 mA                                                                               |                                                                             |                     | 80 mA                                                                               |
| Interface physics, RS 485                           | Yes; 9-pin sub D socket                                                             |                                                                             | Yes                 | Yes; 9-pin sub D socket                                                             |
| Interface physics, FOC                              |                                                                                     | Yes; 4x Simplex socket                                                      |                     |                                                                                     |
| <b>Protocols</b>                                    |                                                                                     |                                                                             |                     |                                                                                     |
| PROFIBUS DP protocol                                | Yes                                                                                 | Yes                                                                         | Yes                 | Yes                                                                                 |
| <b>PROFIBUS DP</b>                                  |                                                                                     |                                                                             |                     |                                                                                     |
| Transmission rate, max.                             | 12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s | 12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 12 Mbit/s | 12 Mbit/s           | 12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s |
| Cable length, max.                                  | 1 200 m                                                                             | 2 m                                                                         |                     |                                                                                     |
| SYNC capability                                     | Yes                                                                                 | Yes                                                                         | Yes                 | Yes                                                                                 |
| FREECE capability                                   | Yes                                                                                 | Yes                                                                         | Yes                 | Yes                                                                                 |
| Direct data exchange (slave-to-slave communication) | Yes                                                                                 | Yes                                                                         | Yes                 | Yes                                                                                 |
| <b>Isochronous mode</b>                             |                                                                                     |                                                                             |                     |                                                                                     |
| Isochronous mode                                    | No                                                                                  | No                                                                          | Yes                 | No                                                                                  |
| <b>Alarms/diagnostics/status information</b>        |                                                                                     |                                                                             |                     |                                                                                     |
| Alarms                                              |                                                                                     |                                                                             |                     |                                                                                     |
| • Alarms                                            | Yes                                                                                 | Yes                                                                         | Yes                 | No                                                                                  |
| Diagnostics                                         |                                                                                     |                                                                             |                     |                                                                                     |
| • Diagnostic functions                              | Yes                                                                                 | Yes                                                                         | Yes                 | Yes                                                                                 |
| Diagnostic indication LED                           |                                                                                     |                                                                             |                     |                                                                                     |
| • Bus fault BF (red)                                | Yes                                                                                 | Yes                                                                         | Yes                 | Yes                                                                                 |
| • Group error SF (red)                              | Yes                                                                                 | Yes                                                                         | Yes                 | Yes                                                                                 |
| • Monitoring 24 V voltage supply ON (green)         | Yes                                                                                 | Yes                                                                         | Yes                 | Yes                                                                                 |
| <b>Isolation</b>                                    |                                                                                     |                                                                             |                     |                                                                                     |
| Isolation checked with                              | 500 V DC                                                                            | 57 V DC / 60 V AC                                                           | 500 V DC            | 500 V DC                                                                            |
| <b>Galvanic isolation</b>                           |                                                                                     |                                                                             |                     |                                                                                     |
| between backplane bus and electronics               | No                                                                                  | No                                                                          | No                  | No                                                                                  |
| between electronic block and PROFIBUS DP            | Yes                                                                                 |                                                                             | Yes                 | Yes                                                                                 |
| between supply voltage and electronics              | No                                                                                  | No                                                                          | No                  | No                                                                                  |

## Technical specifications (continued)

|                                                                       | 6ES7 151-1AA05-0AB0 | 6ES7 151-1AB05-0AB0 | 6ES7 151-1BA02-0AB0 | 6ES7 151-1CA00-0AB0 |
|-----------------------------------------------------------------------|---------------------|---------------------|---------------------|---------------------|
| <b>Permissible potential difference</b><br>between different circuits | 75 V DC / 60 V AC   | 500 V DC            | 75 V DC / 60 V AC   | 75 V DC / 60 V AC   |
| <b>General information</b><br>Vendor identification (VendorID)        | 806Ah               | 806Bh               |                     | 80F3h               |
| <b>Dimensions and weight</b><br>Dimensions                            |                     |                     |                     |                     |
| • Width                                                               | 45 mm               | 45 mm               | 45 mm               | 45 mm               |
| • Height                                                              | 119.5 mm            | 119.5 mm            | 119.5 mm            | 119.5 mm            |
| • Depth                                                               | 75 mm               | 75 mm               | 75 mm               | 75 mm               |
| Weight                                                                |                     |                     |                     |                     |
| • Weight, approx.                                                     | 150 g               | 150 g               | 150 g               | 150 g               |

|                                                             | 6ES7 151-1CA00-1BL0     | 6ES7 151-1CA00-3BL0                                                               |
|-------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------|
| <b>Supply voltages</b><br>Supply voltage of electronics 1L+ |                         |                                                                                   |
| • Rated value (DC)                                          | 24 V                    | 24 V                                                                              |
| • Reverse polarity protection                               | Yes                     | Yes                                                                               |
| <b>Current consumption</b><br>from supply voltage 1L+, max. | 100 mA; 100             | 100 mA                                                                            |
| <b>Address area</b><br>Addressing volume                    |                         |                                                                                   |
| • Outputs                                                   | 100 byte                | 100 byte                                                                          |
| • Inputs                                                    | 100 byte                | 100 byte                                                                          |
| <b>Interfaces</b><br>PROFIBUS DP, output current, max.      |                         | 80 mA                                                                             |
| Interface physics, RS 485                                   | Yes                     | Yes                                                                               |
| Interface physics, FOC                                      | No                      | No                                                                                |
| <b>Connection method</b><br>Inputs/outputs                  |                         | Screw-type and spring-loaded terminals, permanent wiring; 3 and 4-wire connection |
| <b>Protocols</b><br>PROFIBUS DP protocol                    | Yes                     | Yes                                                                               |
| TCP/IP protocol                                             |                         | No                                                                                |
| PROFINET IO                                                 |                         | No                                                                                |
| <b>PROFIBUS DP</b><br>Transmission procedure                | RS 485                  | RS 485                                                                            |
| Cable length, max.                                          | 1 200 m                 | 1 200 m                                                                           |
| Direct data exchange (slave-to-slave communication)         | Yes                     | Yes                                                                               |
| <b>PROFINET IO</b><br>Transmission rate, max.               |                         | 12 Mbit/s                                                                         |
| <b>Isochronous mode</b><br>Isochronous mode                 | No                      | No                                                                                |
| <b>Digital inputs</b><br>Quantity/binary inputs             | 32                      | 16                                                                                |
| Input voltage                                               |                         |                                                                                   |
| • Rated value, DC                                           | 24 V                    | 24 V                                                                              |
| • for signal "0"                                            | -30 to +5 V             | -30 to +5 V                                                                       |
| • for signal "1"                                            | 13 to 30 V              | 13 to 30 V                                                                        |
| Input current                                               |                         |                                                                                   |
| • for signal "1", typ.                                      | 4 mA; at 24 V min. 2 mA | 3 mA                                                                              |



## SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules without CPU  
IM 151-1

## Technical specifications (continued)

|                                                         | 6ES7 151-1CA00-1BL0 | 6ES7 151-1CA00-3BL0 |
|---------------------------------------------------------|---------------------|---------------------|
| Input delay (for rated value of input voltage)          |                     |                     |
| • for standard inputs                                   | 3 ms                | 3 ms                |
| - at "0" to "1", min.                                   | 3 ms                | 3 ms                |
| - at "0" to "1", max.                                   |                     |                     |
| Cable length                                            |                     |                     |
| • Cable length unshielded, max.                         | 1 000 m             | 1 000 m             |
| <b>Digital outputs</b>                                  |                     |                     |
| Quantity/binary outputs                                 | 0                   | 16                  |
| Functionality/short-circuit strength                    |                     | Yes                 |
| Limitation of inductive shutdown voltage to             |                     | L+ (-55 to -60 V)   |
| Lamp load, max.                                         |                     | 5 W                 |
| Controlling a digital input                             |                     | Yes                 |
| Output current                                          |                     |                     |
| • for signal "1" permissible range for 0 to 60 °C, min. |                     | 7 mA                |
| • for signal "0" residual current, max.                 |                     | 0.5 mA              |
| Output delay with resistive load                        |                     |                     |
| • 0 to "1", max.                                        |                     | 0.5 ms              |
| • 1 to "0", max.                                        |                     | 1.3 ms              |
| Switching frequency                                     |                     |                     |
| • with resistive load, max.                             |                     | 100 Hz              |
| • with inductive load, max.                             |                     | 2 Hz                |
| • on lamp load, max.                                    |                     | 10 Hz               |
| Aggregate current of outputs (per group)                |                     |                     |
| • up to 60 °C, max.                                     |                     | 2 A                 |
| Cable length                                            |                     |                     |
| • Cable length unshielded, max.                         |                     | 1 000 m             |
| <b>Encoder</b>                                          |                     |                     |
| Connectable encoders                                    |                     |                     |
| • 2-wire BEROs                                          |                     | Yes                 |
| - permissible quiescent current (2-wire BEROs), max.    |                     | 1.5 mA              |
| <b>Alarms/diagnostics/status information</b>            |                     |                     |
| Alarms                                                  |                     |                     |
| • Alarms                                                | No                  | No                  |
| Diagnostics                                             |                     |                     |
| • Diagnostic functions                                  | Yes                 | Yes                 |
| Diagnostic indication LED                               |                     |                     |
| • Run mode RUN (green)                                  |                     | Yes                 |
| • Group error SF (red)                                  | Yes                 | Yes                 |
| • Status indicator digital output (green)               |                     | Yes                 |
| • Status indicator digital input (green)                |                     | Yes                 |
| • Monitoring 24 V voltage supply ON (green)             | Yes                 | Yes                 |
| • Connection to network LINK (green)                    |                     | No                  |
| • Transmit/receive RX/TX (yellow)                       |                     | No                  |
| <b>Isolation</b>                                        |                     |                     |
| Isolation checked with                                  | 500 V DC            | 500 V DC            |
| <b>Galvanic isolation</b>                               |                     |                     |
| between backplane bus and electronics                   |                     | No                  |
| between supply voltage and electronics                  |                     | No                  |
| Galvanic isolation digital inputs                       |                     |                     |
| • Galvanic isolation digital inputs                     |                     | No                  |
| Galvanic isolation digital outputs                      |                     |                     |
| • Galvanic isolation digital outputs                    |                     | Yes                 |

## Technical specifications (continued)

|                                  | 6ES7 151-1CA00-1BL0 | 6ES7 151-1CA00-3BL0 |
|----------------------------------|---------------------|---------------------|
| <b>Degree of protection</b>      |                     |                     |
| IP20                             | Yes                 | Yes                 |
| <b>General information</b>       |                     |                     |
| Vendor identification (VendorID) |                     | 8200H               |
| <b>Dimensions and weight</b>     |                     |                     |
| Dimensions and weight            |                     |                     |
| • Width                          | 120 mm              | 120 mm              |
| • Height                         | 81 mm               | 81 mm               |
| • Depth                          | 758 mm; 58          | 58 mm               |
| Weight                           |                     |                     |
| • Weight, approx.                |                     | 230 g; EB only      |

## Ordering data

## Order No.

## Order No.

**IM 151-1 BASIC interface module****6ES7 151-1CA00-0AB0**

for ET 200S; transfer rates up to 12 Mbit/s; max. 12 power, electronic and motor start modules can be connected; bus connection via 9-pin sub D incl. termination module

**IM 151-1 COMPACT 32 DI 24 V DC interface module****6ES7 151-1CA00-1BL0**

for ET 200S; transfer rates up to 12 Mbit/s; max. 32 digital inputs, can be expanded by max. 12 power, electronic and motor start modules; bus connection via 9-pin sub D incl. termination module

**IM 151-1 COMPACT 16 DI 24 V DC / 16 DO 24 V/0.5 A interface module****6ES7 151-1CA00-3BL0**

for ET 200S; transfer rates up to 12 Mbit/s; max. 16 digital inputs and 16 digital outputs, can be expanded by max. 12 power, electronic and motor start modules; bus connection via 9-pin sub D incl. termination module

**IM 151-1 STANDARD interface module****6ES7 151-1AA05-0AB0**

for ET 200S; transfer rates up to 12 Mbit/s; data volumes 244 byte each for inputs and outputs, max. 63 power, electronic and motor start modules can be connected; bus connection via 9-pin sub D incl. termination module

**IM 151-1 FO STANDARD interface module****6ES7 151-1AB05-0AB0**

for ET 200S, transfer rates up to 12 Mbit/s; data volumes 244 byte each for inputs and outputs; max. 63 power, electronic and starter modules can be connected; bus connection via integrated fiber-optic cable incl. termination module

**IM 151-1 HIGH FEATURE interface module****6ES7 151-1BA02-0AB0**

for ET 200S; transfer rate up to 12 Mbit/s; data volumes 244 byte each for I/O, up to 63 modules can be connected; connection of PROFI-safe modules, isochronous mode; bus connection via 9-pin sub D incl. termination module

**Accessories****TM-C120S terminal module****6ES7 193-4DL10-0AA0**

Terminal module for ET 200S COMPACT, screw-type terminals

**TM-C120C terminal module****6ES7 193-4DL00-0AA0**

Terminal module for ET 200S COMPACT, spring-loaded terminals

**TE-U120S4x10 add-on terminal****6ES7 193-4FL10-0AA0**

Add-on terminal for TM-C120x terminal modules of ET 200S COMPACT; screw-type terminals for 3-wire connection; please order two for 4-wire connection  
Can also be attached to TM-E/ TM-P, provided at least 120 mm of the construction width attains the same overall height as the terminal module

**TE-U120C4x10 add-on terminal****6ES7 193-4FL00-0AA0**

Add-on terminal for TM-C120x terminal modules of ET 200S COMPACT; spring-loaded terminals for 3-wire connection; please order two for 4-wire connection

Can also be attached to TM-E/ TM-P, provided at least 120 mm of the construction width attains the same overall height as the terminal module

**ET 200S distributed I/O system manuals**

are available on the Internet as PDF files:

[www.siemens.com/simatic-docu](http://www.siemens.com/simatic-docu)

I: Subject to export regulations AL: N and ECCN: EAR99H

## SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules without CPU  
IM 151-1

| Ordering data                                                                                                                                                                                                                                                                                                                              | Order No.                                                                                                                | Order No.                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SIMATIC Manual Collection</b> J<br>Electronic manuals on DVD, multi-language:<br>S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)                                           | <b>6ES7 998-8XC01-8YE0</b>                                                                                               | <b>Label sheets DIN A4 (10 units)</b><br>Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules <ul style="list-style-type: none"> <li>• petrol</li> <li>• red</li> <li>• yellow</li> <li>• light beige</li> </ul> |
| <b>SIMATIC Manual Collection – Update service for 1 year</b> D<br>Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates                                                                                                                                                                                   | <b>6ES7 998-8XC01-8YE2</b>                                                                                               | <b>Label sheets DIN A4 (10 units)</b><br>Can be used for ET 200S COMPACT.<br>Each sheet has 10 labeling strips <ul style="list-style-type: none"> <li>• beige</li> <li>• yellow</li> <li>• red</li> <li>• petrol</li> </ul>                                     |
| <b>PROFIBUS DP bus connector RS 485</b><br>With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbit/s<br>Without PG interface <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul> With PG interface <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul> | <b>6ES7 972-0BA52-0XA0</b><br><b>6ES7 972-0BA52-0XB0</b><br><br><b>6ES7 972-0BB52-0XA0</b><br><b>6ES7 972-0BB52-0XB0</b> | <b>6ES7 193-4BH00-0AA0</b><br><b>6ES7 193-4BD00-0AA0</b><br><b>6ES7 193-4BB00-0AA0</b><br><b>6ES7 193-4BA00-0AA0</b><br><br><b>6ES7 193-4BA10-0AA0</b><br><b>6ES7 193-4BB10-0AA0</b><br><b>6ES7 193-4BD10-0AA0</b><br><b>6ES7 193-4BH10-0AA0</b>                |
| <b>100 Simplex connectors</b> I<br>For plastic fiber-optic cable incl. 5 polishing sets                                                                                                                                                                                                                                                    | <b>6GK1 901-0FB00-0AA0</b>                                                                                               | <b>Termination module</b><br>as spare part for ET 200S                                                                                                                                                                                                          |
| <b>50 plug adapters</b><br>For 2 Simplex connectors each                                                                                                                                                                                                                                                                                   | <b>6ES7 195-1BE00-0XA0</b>                                                                                               | <b>Power supply connector</b><br>Spare part; for connecting the 24 V DC supply voltage <ul style="list-style-type: none"> <li>• with push-in terminals</li> <li>• with screw-type terminals</li> </ul>                                                          |
|                                                                                                                                                                                                                                                                                                                                            |                                                                                                                          | <b>SIMATIC S5, 35 mm DIN rail</b> <ul style="list-style-type: none"> <li>• Length: 483 mm for 19" cabinets</li> <li>• Length: 530 mm for 600 mm cabinets</li> <li>• Length: 830 mm for 900 mm cabinets</li> <li>• Length: 2 m</li> </ul>                        |

6ES7 193-4BH00-0AA0  
6ES7 193-4BD00-0AA0  
6ES7 193-4BB00-0AA0  
6ES7 193-4BA00-0AA0

6ES7 193-4BA10-0AA0  
6ES7 193-4BB10-0AA0  
6ES7 193-4BD10-0AA0  
6ES7 193-4BH10-0AA0

6ES7 193-4JA00-0AA0

6ES7 193-4JB00-0AA0  
6ES7 193-4JB50-0AA0

6ES5 710-8MA11  
6ES5 710-8MA21

6ES5 710-8MA31  
6ES5 710-8MA41

D: Subject to export regulations AL: N and ECCN: 5D992  
I: Subject to export regulations AL: N and ECCN: EAR99H  
J: Subject to export regulations AL: N and ECCN: EAR99S

## Overview



- Interface module for linking the ET 200S to PROFINET
- Handles all data exchange with the PROFINET I/O Controller
- 3 versions:
  - IM151-3 PN STANDARD
  - IM151-3 PN HIGH FEATURE and IM 151-3 PN FO: supports, in contrast to the STANDARD version, the operation of PROFI-safe F modules
- with integrated 2-port switch for line topology
- Delivery including termination module

## Note:

Micro Memory Card required for operation depending on the configuration.

## Technical specifications

|                                              | 6ES7 151-3AA23-0AB0 | 6ES7 151-3BA23-0AB0 |
|----------------------------------------------|---------------------|---------------------|
| <b>Supply voltages</b>                       |                     |                     |
| Supply voltage of electronics 1L+            |                     |                     |
| • Rated value (DC)                           | 24 V                | 24 V                |
| • Reverse polarity protection                | Yes                 | Yes                 |
| Mains/voltage failure jumpering, min.        | 20 ms               | 20 ms               |
| <b>Current consumption</b>                   |                     |                     |
| from supply voltage 1L+, max.                | 250 mA              | 250 mA              |
| <b>Current consumption/power loss</b>        |                     |                     |
| Power loss, typ.                             | 2.5 W               | 2.5 W               |
| <b>Address area</b>                          |                     |                     |
| Addressing volume                            |                     |                     |
| • Outputs                                    | 256 byte            | 256 byte            |
| • Inputs                                     | 256 byte            | 256 byte            |
| <b>Interfaces</b>                            |                     |                     |
| Automatic detection of transmission speed    | Yes                 | Yes                 |
| <b>Connection point</b>                      |                     |                     |
| RJ45                                         | Yes                 | Yes                 |
| <b>Protocols</b>                             |                     |                     |
| PROFINET IO                                  | Yes                 | Yes                 |
| <b>PROFINET IO</b>                           |                     |                     |
| Transmission speed, max.                     | 100 MBit/s          | 100 MBit/s          |
| <b>Isochronous mode</b>                      |                     |                     |
| Isochronous mode                             | Yes                 | Yes                 |
| <b>Status information/alarms/diagnostics</b> |                     |                     |
| Alarms                                       |                     |                     |
| • Alarms                                     | Yes                 | Yes                 |
| Diagnostics                                  |                     |                     |
| • Diagnostic functions                       | Yes                 | Yes                 |
| Diagnostic indication LED                    |                     |                     |
| • Bus error BF (red)                         | Yes                 | Yes                 |
| • Collective error SF (red)                  | Yes                 | Yes                 |
| • Monitoring 24 V voltage supply ON (green)  | Yes                 | Yes                 |
| • Connection to network LINK (green)         | Yes                 | Yes                 |
| • Maintenance (yellow)                       | Yes                 | Yes                 |

## SIMATIC ET 200 distributed I/O

## ET 200S

Interface modules without CPU  
IM 151-3 PN

## Technical specifications (continued)

|                                        | 6ES7 151-3AA23-0AB0 | 6ES7 151-3BA23-0AB0 |
|----------------------------------------|---------------------|---------------------|
| <b>Galvanic isolation</b>              |                     |                     |
| between backplane bus and electronics  | No                  | No                  |
| between supply voltage and electronics | No                  | No                  |
| between Ethernet and electronics       | Yes                 | Yes                 |
| <b>General information</b>             |                     |                     |
| Vendor identification (VendorID)       | 002AH               | 002AH               |
| Device identifier (DeviceID)           | 0301                | 0301H               |
| <b>Dimensions</b>                      |                     |                     |
| Dimensions                             |                     |                     |
| • Width                                | 60 mm               | 60 mm               |
| • Height                               | 119.5 mm            | 119.5 mm            |
| • Depth                                | 75 mm               | 75 mm               |
| <b>Weights</b>                         |                     |                     |
| • Weight, approx.                      | 120 g               | 135 g               |

## Ordering data

## Order No.

## Order No.

**IM 151-3 PN interface module**

For ET 200S; transfer rates up to 100 Mbit/s; data volume depends on the number of modules inserted, up to 63 modules can be connected, bus connection through RJ45

**6ES7 151-3AA23-0AB0****IM 151-3 PN PROFINET High Feature interface module**

for ET 200S; transfer rate up to 100 Mbit/s; max. 63 modules up to 2 m wide can be connected; bus connection via RJ45, incl. termination module

**6ES7 151-3BA23-0AB0****IM 151-3 FO interface module**

for ET 200S; with 2 PROFINET FO-interfaces and integrated 2-port switch, max. 63 modules up to 2 m wide can be connected, incl. termination module

**6ES7 151-3BB23-0AB0****Accessories****Industrial Ethernet FC RJ45 Plug 90**

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet

1 unit

**6GK1 901-1BB20-2AA0**

10 units

**6GK1 901-1BB20-2AB0**

50 units

**6GK1 901-1BB20-2AE0****Industrial Ethernet FastConnect installation cables**

Fast Connect standard cable

**6XV1 840-2AH10**

Fast Connect trailing cable

**6XV1 840-3AH10**

Fast Connect marine cable

**6XV1 840-4AH10****Termination Kits**

SC RJ POF Plug  
Assembly case for on-site assembly of SC RJ plugs consisting of stripping tool, kevlar cutter, microscope, abrasive paper, grinding support

**6GK1 900-0ML00-0AA0**

IE SC RJ POF Plug  
Screw-in plug for on-site assembly to POF fiber optic cable (1 pack = 20 units)

**6GK1 900-0MB00-0AC0**

IE SC RJ Refill Set POF  
Refill set for Termination Kit SC RJ POF Plug, consisting of abrasive paper and grinding plate (set of 5)

**6GK1 900-0MN00-0AA0**

SC RJ POF Plug  
Assembly case for on-site assembly of SC RJ plugs consisting of stripping tool, buffer stripping tool, kevlar cutter, fiber breaking tool, microscope

**6GK1 900-0NL00-0AA0**

Industrial Ethernet SC RJ PCF Plug  
Screw-in plug for on-site assembly to PCF fiber optic cable (1 pack = 10 units)

**6GK1 900-0NB00-0AC0****Industrial Ethernet Fast Connect stripping tool****6GK1 901-1GA00****MMC 64 KB <sup>1)</sup>**

For storing the device name

**6ES7 953-8LF20-0AA0****MMC 128 KB <sup>1)</sup>**

For storing the device name

**6ES7 953-8LG20-0AA0****MMC 512 KB <sup>1)</sup>**

For storing the device name

**6ES7 953-8LJ20-0AA0**

| Ordering data                                                                                                                                                                                                                                                                                    | Order No.                  | Order No.                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MMC 2 MB <sup>1)</sup></b><br>For storing the device name and/or firmware update                                                                                                                                                                                                              | <b>6ES7 953-8LL20-0AA0</b> | <b>Label sheets DIN A4 (10 units)</b><br>Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules<br>• petrol<br>• red<br>• yellow<br>• light beige                                                                                                                                                                                                                           |
| <b>MMC 4 MB <sup>1)</sup></b><br>For storing the device name and/or firmware update                                                                                                                                                                                                              | <b>6ES7 953-8LM20-0AA0</b> | <b>Termination module</b><br>as spare part for ET 200S                                                                                                                                                                                                                                                                                                                                                                   |
| <b>MMC 8 MB <sup>1)</sup></b><br>For storing the device name and/or firmware update                                                                                                                                                                                                              | <b>6ES7 953-8LP20-0AA0</b> | <b>Power supply connector</b><br>Spare part; for connecting the 24 V DC supply voltage<br>• with push-in terminals<br>• with screw-type terminals                                                                                                                                                                                                                                                                        |
| <b>ET 200S distributed I/O system manuals</b><br>are available on the Internet as PDF files:<br><a href="http://www.siemens.com/simatic-docu">www.siemens.com/simatic-docu</a>                                                                                                                   |                            | <b>DIN rail 35 mm</b><br>• Length: 483 mm for 19" cabinets<br>• Length: 530 mm for 600 mm cabinets<br>• Length: 830 mm for 900 mm cabinets<br>• 2 m long                                                                                                                                                                                                                                                                 |
| <b>SIMATIC Manual Collection</b> J<br>Electronic manuals on DVD, multi-language:<br>S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication) | <b>6ES7 998-8XC01-8YE0</b> | <b>Industrial Ethernet Switches</b><br>Managed Industrial Ethernet Switches; Isochronous real time, LED diagnostics, fault signaling contact with SET button, redundant power supply<br>• SCALANCE X202-2P IRT; 2 x 10/100 Mbit/s RJ45 ports, 2 x 100 Mbit/s POF/PCF SC RJ<br>• SCALANCE X201-3P IRT; 1 x 10/100 Mbit/s RJ45 ports, 3 x 100 Mbit/s POF/PCF SC RJ<br>• SCALANCE X200-4P IRT; 4 x 100 Mbit/s POF/PCF SC RJ |
| <b>SIMATIC Manual Collection – Update service for 1 year</b> D<br>Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates                                                                                                                                         | <b>6ES7 998-8XC01-8YE2</b> |                                                                                                                                                                                                                                                                                                                                                                                                                          |

<sup>1)</sup> For operating the IM 151-3, an MMC is essential

D: Subject to export regulations AL: N and ECCN: 5D992

I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S

## SIMATIC ET 200 distributed I/O

## ET 200S

SIPLUS interface modules without CPU  
SIPLUS IM 151-1

## Overview



- Interface module for linking the ET 200S to PROFIBUS DP
- Handles all data exchange with the PROFIBUS DP master

**Note:**

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

|                           | SIPLUS IM 151-1<br>Standard                                                           | SIPLUS IM 151-1<br>High Feature |
|---------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| Order number              | 6AG1 151-1AA05-7AB0                                                                   | 6AG1 151-1BA02-2AB0             |
| Order No. based on        | 6ES7 151-1AA05-0AB0                                                                   | 6ES7 151-1BA02-0AB0             |
| Ambient temperature range | -25 ... +70 °C                                                                        | -25 ... +60 °C                  |
| Conformal coating         | Coating of the printed circuit boards and the electronic components                   |                                 |
| Technical data            | The technical data of the standard product applies except for the ambient conditions. |                                 |

|                                                                              | SIPLUS IM 151-1<br>Standard                                                                                                                                                           | SIPLUS IM 151-1<br>High Feature |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| <b>Ambient conditions</b>                                                    |                                                                                                                                                                                       |                                 |
| Relative humidity                                                            | 5 ... 100 %<br>Condensation permissible                                                                                                                                               |                                 |
| Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                         |                                 |
| Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                                 |                                 |
| Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                                 |                                 |
| Air pressure (depending on the highest positive temperature range specified) | 1080 ... 795 hPa (-1000 ... +2000 m)<br>see ambient temperature range<br>795 ... 658 hPa (+2000 ... +3500 m)<br>derating 10 K<br>658 ... 540 hPa (+3500 ... +5000 m)<br>derating 20 K |                                 |

<sup>1)</sup> ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm; H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O<sub>3</sub> < 0.1 ppm; NOX < 5.2 ppm

Limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O<sub>3</sub> < 1.0 ppm; NOX < 10.4 ppm

<sup>2)</sup> The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

| Ordering data                                                                                                                                                                                                                                                                                                                                                                         | Order No.                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| <b>SIPLUS IM 151-1 STANDARD interface module</b><br>(extended temperature range and medial exposure)<br><br>for ET 200S; transfer rates up to 12 Mbit/s; data volumes 244 byte each for inputs and outputs, max. 63 power, electronic and motor start modules can be connected; bus connection via 9-pin D-sub incl. termination module                                               | <b>6AG1 151-1AA05-7AB0</b>      |
| <b>SIPLUS IM 151-1 HIGH FEATURE interface module</b><br>(extended temperature range and medial exposure)<br><br>for ET 200S; transfer rate up to 12 Mbit/s; data volumes 244 byte each for inputs and outputs, up to 63 modules can be connected; connection of PROFI-safe modules, isochronous mode (clock synchronization); bus connection via 9-pin Sub-D incl. termination module | <b>6AG1 151-1BA02-2AB0</b>      |
| <b>Accessories</b>                                                                                                                                                                                                                                                                                                                                                                    | See SIMATIC IM 151-1, page 9/49 |

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

I: Subject to export regulations AL: N and ECCN: EAR99H

## Overview



- Interface module for connection of ET 200S PROFINET
- Handles all data exchange with the PROFINET I/O Controller
- IM 151-3 PN STANDARD
- With integrated 2-port switch for line topology

Micro Memory Card required for CPU operation.

**Note:**

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

| SIPLUS IM 151-3 PN                                                           |                                                                                                                                                                                                |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Order number</b>                                                          | <b>6AG1 151-3AA23-2AB0</b>                                                                                                                                                                     |
| <b>Order number based on</b>                                                 | <b>6ES7 151-3AA23-0AB0</b>                                                                                                                                                                     |
| Ambient temperature range                                                    | -25 ... +60 °C                                                                                                                                                                                 |
| Conformal coating                                                            | Coating of the printed circuit boards and the electronic components                                                                                                                            |
| Technical data                                                               | The technical data of the standard product applies except for the ambient conditions.                                                                                                          |
| <b>Ambient conditions</b>                                                    |                                                                                                                                                                                                |
| Relative humidity                                                            | 5 ... 100 %<br>Condensation permissible                                                                                                                                                        |
| Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                                  |
| Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                                          |
| Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                                          |
| Air pressure (depending on the highest positive temperature range specified) | 1080 ... 795 hPa<br>(-1000 ... +2000 m)<br>see ambient temperature range<br>795 ... 658 hPa<br>(+2000 ... +3500 m)<br>derating 10 K<br>658 ... 540 hPa<br>(+3500 ... +5000 m)<br>derating 20 K |

- <sup>1)</sup> ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm; H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O<sub>3</sub> < 0.1 ppm; NOX < 5.2 ppm  
Limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O<sub>3</sub> < 1.0 ppm; NOX < 10.4 ppm
- <sup>2)</sup> The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

Technical documentation on SIPLUS is available under:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

| Ordering data                                                                                                                                                                                                                                                                 | Order No.                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| <b>SIPLUS IM 151-3 PN interface module</b><br><br>(extended temperature range and medial exposure)<br><br>For ET 200S; transfer rates up to 100 Mbit/s; data volume depends on the number of modules inserted, up to 63 modules can be connected, bus connection through RJ45 | <b>6AG1 151-3AA23-2AB0</b>                          |
| <b>Accessories</b>                                                                                                                                                                                                                                                            |                                                     |
|                                                                                                                                                                                                                                                                               | See SIMATIC IM 151-3 PN interface module, page 9/52 |

H: Subject to export regulations AL: 91999 and ECCN: EAR99H



## SIMATIC ET 200 distributed I/O

## ET 200S

## I/O modules

## Power modules for PM-E electronic modules

## Overview



- For monitoring and, depending on the version, fusing the load and sensor supply voltage
- Can be plugged onto TM-P terminal modules with automatic coding
- Diagnostic message for voltage and blown fuse (can be switched off via configuration)
- PM-E 24 V DC Standard
  - load voltage diagnostics
- PM-E 24 V DC High Feature
  - load voltage and reverse voltage diagnostics
  - with status information
  - option handling (only in combination with the IM 151-1 Standard, IM 151-1 FO Standard and IM 151-1 High Feature)
- 24 to 48 V DC PM-E power module
  - load voltage diagnostics
  - with status information
  - option handling (only in combination with the IM 151-1 Standard, IM 151-1 FO Standard and IM 151-1 High Feature)
- PM-E 24 V DC to 230 V AC power module
  - power module for universal use
  - with integral replaceable fuse
  - with status information
  - option handling (only in combination with the IM 151-1 Standard, IM 151-1 FO Standard and IM151-1 High Feature)

## Technical specifications

|                                               | 6ES7 138-4CA01-0AA0                                                      | 6ES7 138-4CB11-0AB0 |
|-----------------------------------------------|--------------------------------------------------------------------------|---------------------|
| Product type designation                      | PM-E 24 V DC                                                             |                     |
| Power supply                                  |                                                                          |                     |
| Current carrying capacity                     | 10 A                                                                     |                     |
| • Current carrying capacity up to 60 °C, max. |                                                                          |                     |
| Supply voltages                               |                                                                          |                     |
| Load voltage L+                               | 24 V                                                                     |                     |
| • Rated value (DC)                            |                                                                          |                     |
| • Short-circuit protection                    |                                                                          |                     |
| • Reverse polarity protection                 | Yes                                                                      |                     |
| Current consumption                           |                                                                          |                     |
| from load voltage 1L+ (without load), max.    | 4 mA                                                                     |                     |
| Power losses                                  |                                                                          |                     |
| Power loss, typ.                              | 0.1 W                                                                    |                     |
| Parameter                                     |                                                                          |                     |
| Remark                                        | 3 byte                                                                   |                     |
| Missing load voltage                          | Disable / enable                                                         |                     |
| Alarms/diagnostics/status information         |                                                                          |                     |
| Diagnostics                                   | Yes                                                                      |                     |
| • Diagnostics                                 |                                                                          |                     |
| • Missing load voltage                        | Yes                                                                      |                     |
| Diagnostic indication LED                     | Yes                                                                      |                     |
| • Rated load voltage PWR (green)              |                                                                          |                     |
| • Group error SF (red)                        | Yes                                                                      |                     |
| Isolation                                     |                                                                          |                     |
| Isolation checked with                        | 500 V DC                                                                 |                     |
| Galvanic isolation                            |                                                                          |                     |
| primary/secondary                             | Yes; between rated load voltage and backplane bus, between power modules |                     |
| Dimensions and weight                         |                                                                          |                     |
| Dimensions                                    |                                                                          |                     |
| • Width                                       | 15 mm                                                                    | 15 mm               |
| • Height                                      | 81 mm                                                                    | 81 mm               |
| • Depth                                       | 52 mm                                                                    | 52 mm               |
| Weight                                        |                                                                          |                     |
| • Weight, approx.                             | 35 g                                                                     |                     |

**Technical specifications** (continued)

|                                                                          |                                                                                                     |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <b>6ES7 138-4CA50-0AB0</b>                                               |                                                                                                     |
| <b>Product type designation</b>                                          | PM-E 24 to 48 V DC                                                                                  |
| <b>Power supply</b><br>Current carrying capacity                         | 10 A                                                                                                |
| • Current carrying capacity up to 60 °C, max.                            |                                                                                                     |
| <b>Supply voltages</b><br>Load voltage L+                                | 24 to 48 V DC<br>No; external (e.g. automatic circuit breaker), tripping characteristic B, C<br>Yes |
| • Rated values                                                           |                                                                                                     |
| • Short-circuit protection                                               |                                                                                                     |
| • Reverse polarity protection                                            |                                                                                                     |
| <b>Current consumption</b><br>from load voltage 1L+ (without load), max. | 12 mA                                                                                               |
| <b>Power losses</b><br>Power loss, typ.                                  | 500 W; mW                                                                                           |
| <b>Parameter</b><br>Remark                                               | 3 byte                                                                                              |
| Missing load voltage                                                     | Disable / enable                                                                                    |
| <b>Alarms/diagnostics/status information</b><br>Diagnostics              | Yes<br>Yes                                                                                          |
| • Diagnostics                                                            |                                                                                                     |
| • Missing load voltage                                                   |                                                                                                     |
| Diagnostic indication LED                                                | Yes<br>Yes                                                                                          |
| • Rated load voltage PWR (green)                                         |                                                                                                     |
| • Group error SF (red)                                                   |                                                                                                     |
| <b>Isolation</b><br>Isolation checked with                               | 500 V DC                                                                                            |
| <b>Galvanic isolation</b><br>primary/secondary                           | Yes; between rated load voltage and backplane bus, between power modules                            |
| <b>Dimensions and weight</b><br>Dimensions                               | 15 mm<br>81 mm<br>52 mm                                                                             |
| • Width                                                                  |                                                                                                     |
| • Height                                                                 |                                                                                                     |
| • Depth                                                                  |                                                                                                     |
| Weight                                                                   | 35 g                                                                                                |
| • Weight, approx.                                                        |                                                                                                     |

**Ordering data****Order No.****PM-E 24 V DC Standard power module <sup>1)</sup>**

For electronic modules; with diagnostics

1 unit

**6ES7 138-4CA01-0AA0**

5 units

**6ES7 138-4CA01-1AA0****PM-E 24 V DC High Feature power module <sup>1)</sup>**

For electronic modules; with diagnostics

**6ES7 138-4CA60-0AB0****24 ... 48 V DC PM-E power module**

For electronic modules; with diagnostics, with status bit "load voltage" present

1 unit

**6ES7 138-4CA50-0AB0**

5 units

**6ES7 138-4CA50-1AB0****Power module  
PM-E 24 ... 48 V DC,  
42 ... 230 V AC**

For electronic modules; with diagnostics and fuse

**6ES7 138-4CB11-0AB0****Accessories****Label sheets DIN A4 (10 units)**

Each sheet contains 60 label strips for I/O modules and 20 label strips for interface modules

- petrol
- red
- yellow
- light beige

**6ES7 193-4BH00-0AA0**  
**6ES7 193-4BD00-0AA0**  
**6ES7 193-4BB00-0AA0**  
**6ES7 193-4BA00-0AA0**

<sup>1)</sup> Can be used for all electronic and technology modules except  
2 DI 120 V AC / 2 DI 230 V AC / 2 DO 120/230 V AC

I: Subject to export regulations AL: N and ECCN: EAR99H

**Selection tool for terminal modules**

| <b>Power modules</b>                    | <b>TM-P terminal modules for power modules</b> |              |              |              |
|-----------------------------------------|------------------------------------------------|--------------|--------------|--------------|
| Screw-type terminal type designation    | TM-P15S23-A1                                   | TM-P15S23-A0 | TM-P15S22-01 | TM-P30S44-A0 |
| Order No.: 6ES7 193...                  | 4CC20-0AA0                                     | 4CD20-0AA0   | 4CE00-0AA0   | 4CK20-0AA0   |
| Spring-loaded terminal type designation | TM-P15C23-A1                                   | TM-P15C23-A0 | TM-P15C22-01 | TM-P30C44-A0 |
| Order No.: 6ES7 193...                  | 4CC30-0AA0                                     | 4CD30-0AA0   | 4CE10-0AA0   | 4CK30-0AA0   |
| FastConnect type designation            | TM-P15N23-A1                                   | TM-P15N23-A0 | TM-P15N22-01 | Soon to come |
| Order No.: 6ES7 193...                  | 4CC70-0AA0                                     | 4CD70-0AA0   | 4CE60-0AA0   |              |
| PM-E 24 V DC                            | •                                              | •            | •            |              |
| PM-E 24 ... 48 V DC                     | •                                              | •            | •            |              |
| PM-E 24 V DC/120/230 V AC               | •                                              | •            | •            |              |
| PM-E F 24 V DC PROFIsafe                |                                                |              |              | •            |

## SIMATIC ET 200 distributed I/O

## ET 200S

I/O modules  
Spare modules

## Overview



- Applicable only on IM 151-1 Standard interface modules as of 6ES7151-1AA04-0AB0 and IM 151-1 High Feature as of 6ES7151-1BA02-0AB0
- Suitable for all TM-E terminal modules (15 mm and 30 mm construction width)
- Reserves one slot for any electronic module. The spare module is inserted into the reserved slot of the ET 200S configuration.
- Terminal module can be wired up for the function to be used later
- The spare module has no connection to the terminals of the TM-E terminal module. The TM-E terminal module can therefore be completely wired up and prepared for its future purpose.
- Parameterizable diagnostic response with IM 151-1 STANDARD and IM 151-1 HIGH FEATURE
- Facilitates retrofitting of I/O modules during operation
- Options can be released via the PLC program without the need for re-engineering

## Technical specifications

|                                              | 6ES7 138-4AA01-0AA0            | 6ES7 138-4AA11-0AA0            |
|----------------------------------------------|--------------------------------|--------------------------------|
| <b>Power losses</b>                          |                                |                                |
| Power loss, typ.                             | 0.025 W                        | 0.025 W                        |
| <b>Address area</b>                          |                                |                                |
| Occupied address area                        |                                |                                |
| • Inputs                                     | according to configured module | according to configured module |
| <b>Digital inputs</b>                        |                                |                                |
| Number of digital inputs                     | 0                              | 0                              |
| <b>Parameter</b>                             |                                |                                |
| Remark                                       | according to configured module | according to configured module |
| <b>Alarms/diagnostics/status information</b> |                                |                                |
| Diagnostics                                  |                                |                                |
| • Diagnostic functions                       | No                             | No                             |
| Diagnostic indication LED                    |                                |                                |
| • Status indicator digital input (green)     | No                             | No                             |
| <b>Dimensions and weight</b>                 |                                |                                |
| Dimensions                                   |                                |                                |
| • Width                                      | 15 mm                          | 30 mm                          |
| • Height                                     | 81 mm                          | 81 mm                          |
| • Depth                                      | 52 mm                          | 52 mm                          |
| Weight                                       |                                |                                |
| • Weight, approx.                            | 33 g                           | 55 g                           |

## Ordering data

## Order No.

## Spare modules for ET 200S

- for reserving unused slots
- 15 mm overall width (5 units)
  - 30 mm overall width (1 unit)

**6ES7 138-4AA01-0AA0**  
**6ES7 138-4AA11-0AA0**

**Overview**

- Potential isolation module with 4 outputs
- Output current 5 A per output / 10 A per module
- Nominal load voltage: According to the load voltage on the power module of this load voltage group
- Is suitable for all terminal modules TM-E (construction width 15 mm)

**Technical specifications**

|                                                                                        |                                   |
|----------------------------------------------------------------------------------------|-----------------------------------|
| <b>Potential isolation module</b>                                                      | <b>6ES7138-4FD00-0AA0</b>         |
| <b>Module-specific data</b>                                                            |                                   |
| Supported synchronous operation                                                        | no                                |
| Number of outputs                                                                      | 4                                 |
| Cable length                                                                           |                                   |
| • Unshielded                                                                           | max. 600 m                        |
| • Shielded                                                                             | max. 1000 m                       |
| Parameter length                                                                       | 1 byte                            |
| <b>Voltages, Currents, Potentials</b>                                                  |                                   |
| Nominal load voltage L+ (from power module)                                            | 24 ... 48 V DC; 24 AC ... 230 V   |
| • Polarity reversal protection                                                         | no                                |
| Total current of the outputs (per module)                                              | max. 10 A                         |
| Potential isolation                                                                    |                                   |
| • Between the channels                                                                 | no                                |
| • Between the channels and backplane bus                                               | Yes                               |
| Permissible potential difference                                                       |                                   |
| • Between the supply voltage and the backplane bus                                     | 75 V DC, 240 V AC                 |
| Isolation tested                                                                       |                                   |
| • Between the supply voltage and the backplane bus                                     | 500 V DC, 1500 V AC               |
| Diagnostic alarm                                                                       | no                                |
| <b>Data for selecting an actuator</b>                                                  |                                   |
| Short-circuit protection for the output                                                | No, possible via PM-E or external |
| <b>Dimensions and weight</b>                                                           |                                   |
| Dimensions W × H × D (mm, the total dimensions depend on the selected terminal module) | 15 x 81 x 52                      |
| Weight                                                                                 | Approx. 33 g                      |

**Ordering data****Order No.****Potential isolation module for ET 200S****6ES7138-4FD00-0AA0**

for preparing the load voltage on additional terminals, 15 mm construction width, 1 unit

**Accessories for labeling****Label sheets DIN A4 (10 units)**

Each sheet contains 60 label strips for I/O modules and 20 label strips for interface modules

- petrol
- red
- yellow
- light beige

**6ES7 193-4BH00-0AA0**  
**6ES7 193-4BD00-0AA0**  
**6ES7 193-4BB00-0AA0**  
**6ES7 193-4BA00-0AA0**

I: Subject to export regulations AL: N and ECCN: EAR99H

## SIMATIC ET 200 distributed I/O

## ET 200S

I/O modules  
Digital electronic modules

## Overview



- 2, 4 and 8-channel digital inputs and outputs for the ET 200S
- Can be plugged onto TM-E terminal modules with automatic coding
- High-feature versions for enhanced plant availability, additional functions and comprehensive diagnostics
- Hot swapping of modules possible during operation

## Technical specifications

|                                                     | 6ES7 131-4BB01-0AA0    | 6ES7 131-4BB01-0AB0    | 6ES7 131-4BD01-0AA0    | 6ES7 131-4BD01-0AB0    | 6ES7 131-4BD51-0AA0    | 6ES7 131-4BF00-0AA0             |
|-----------------------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|---------------------------------|
| <b>Supply voltages</b>                              |                        |                        |                        |                        |                        |                                 |
| Rated value                                         |                        |                        |                        |                        |                        |                                 |
| • 24 V DC                                           | Yes; from power module | Yes; from power module | Yes; from power module | Yes; from power module | Yes; from power module | Yes                             |
| • permissible range, lower limit (DC)               | 20.4 V                 | 20.4 V                 | 20.4 V                 | 20.4 V                 | 20.4 V                 | 20.4 V                          |
| • permissible range, upper limit (DC)               | 28.8 V                 | 28.8 V                 | 28.8 V                 | 28.8 V                 | 28.8 V                 | 28.8 V                          |
| • reverse polarity protection                       | Yes                    | Yes                    | Yes                    | Yes                    | Yes                    | Yes                             |
| <b>Current consumption</b>                          |                        |                        |                        |                        |                        |                                 |
| from backplane bus 3.3 V DC, max.                   | 10 mA                  | 10 mA                  | 10 mA                  | 10 mA                  |                        | 10 mA                           |
| from supply voltage L+, max.                        | Dependent on encoder   | Dependent on encoder   | Dependent on encoder   | Dependent on encoder   | Dependent on encoder   | Dependent on encoder            |
| <b>Power losses</b>                                 |                        |                        |                        |                        |                        |                                 |
| Power loss, typ.                                    | 0.4 W                  | 0.4 W                  | 0.7 W                  | 0.7 W                  | 0.7 W                  | 1.2 W                           |
| <b>Address area</b>                                 |                        |                        |                        |                        |                        |                                 |
| Address space per module                            |                        |                        |                        |                        |                        |                                 |
| • with packing                                      | 2 bit                  | 2 bit                  | 4 bit                  | 4 bit                  | 4 bit                  |                                 |
| • without packing                                   | 1 byte                 | 1 byte                 | 1 byte                 | 1 byte                 | 1 byte                 | 1 byte                          |
| <b>Isochronous mode</b>                             |                        |                        |                        |                        |                        |                                 |
| Isochronous mode                                    |                        |                        |                        |                        |                        | Yes; TWE = 3000 us              |
| <b>Digital inputs</b>                               |                        |                        |                        |                        |                        |                                 |
| Number of digital inputs                            | 2                      | 2                      | 4                      | 4                      | 4                      | 8                               |
| Number of simultaneously controllable inputs        |                        |                        |                        |                        |                        | 8                               |
| Input characteristic curve acc. to IEC 1131, Type 1 | Yes                    | Yes                    | Yes                    | Yes                    | Yes                    | Yes; 2-wire sensors connectable |
| Input voltage                                       |                        |                        |                        |                        |                        |                                 |
| • rated value, DC                                   | 24 V                   | 24 V                   | 24 V                   | 24 V                   | 24 V                   | 24 V                            |
| • for signal "0"                                    | -30 to +5 V            | -30 to +5 V            | -30 to +5 V            | -30 to +5 V            | -5 to +30 V            | -30 to +5 V                     |
| • for signal "1"                                    | 15 to 30 V             | 11 to 30 V             | 15 to 30 V             | 11 to 30 V             | -15 to -30V            | 15 to 30 V                      |
| Input current                                       |                        |                        |                        |                        |                        |                                 |
| • for signal "1", typ.                              | 7 mA; at 24 V          | 8 mA                   | 7 mA; at 24 V          | 8 mA                   | 7 mA; at 24 V          | 5 mA                            |

## Technical specifications (continued)

|                                                                     | 6ES7 131-4BB01-0AA0          | 6ES7 131-4BB01-0AB0                                       | 6ES7 131-4BD01-0AA0          | 6ES7 131-4BD01-0AB0                                       | 6ES7 131-4BD51-0AA0       | 6ES7 131-4BF00-0AA0                            |
|---------------------------------------------------------------------|------------------------------|-----------------------------------------------------------|------------------------------|-----------------------------------------------------------|---------------------------|------------------------------------------------|
| Input delay (for rated value of input voltage)                      |                              |                                                           |                              |                                                           |                           |                                                |
| • for standard inputs - parameterizable                             | No                           | Yes; 0.1 / 0.5 / 3 / 15 ms                                | No                           | Yes; 0.1 / 0.5 / 3 / 15 ms                                | No                        | No                                             |
| - at "0" to "1", min.                                               | 2 ms; typically 3 ms         | 0.05 / 0.4 / 2.7 / 14.85                                  | 2 ms; typically 3 ms         | 0.05 / 0.4 / 2.7 / 14.85                                  | 2 ms; typically 3 ms      | 2 ms                                           |
| - at "0" to "1", max.                                               | 4.5 ms                       | 0.15 / 0.6 / 3.3 / 15.15                                  | 4.5 ms                       | 0.15 / 0.6 / 3.3 / 15.15                                  | 4.5 ms                    | 4.5 ms                                         |
| - at "1" to "0", min.                                               | 2 ms; typically 3 ms         | 0.05 / 0.4 / 2.7 / 14.85                                  | 2 ms; typically 3 ms         | 0.05 / 0.4 / 2.7 / 14.85                                  | 2 ms; typically 3 ms      | 2 ms                                           |
| - at "1" to "0", max.                                               | 4.5 ms                       | 0.15 / 0.6 / 3.3 / 15.15                                  | 4.5 ms                       | 0.15 / 0.6 / 3.3 / 15.15                                  | 4.5 ms                    | 4.5 ms                                         |
| Cable length                                                        |                              |                                                           |                              |                                                           |                           |                                                |
| • Cable length, shielded, max.                                      | 1 000 m                      | 1 000 m                                                   | 1 000 m                      | 1 000 m                                                   | 1 000 m                   | 1 000 m                                        |
| • Cable length unshielded, max.                                     | 600 m                        | 600 m                                                     | 600 m                        | 600 m                                                     | 600 m                     | 600 m                                          |
| <b>Encoder supply</b>                                               |                              |                                                           |                              |                                                           |                           |                                                |
| Number of outputs                                                   |                              |                                                           |                              |                                                           |                           | 0; no encoder supply                           |
| Output voltage                                                      | min. L+ (-0.5 V), under load | min. L+ (-0.5 V), under load                              | min. L+ (-0.5 V), under load | min. L+ (-0.5 V), under load                              | max. M +0.5 V, under load |                                                |
| Output current, rated value                                         | 500 mA                       | 500 mA                                                    | 500 mA                       | 500 mA                                                    | 500 mA                    |                                                |
| Output current, permissible range                                   | 0 to 500 mA                  | 0 to 500 mA                                               | 0 to 500 mA                  | 0 to 500 mA                                               | 0 to 500 mA               |                                                |
| Short-circuit protection                                            |                              | Yes; electronic                                           |                              | Yes; electronic                                           |                           |                                                |
| <b>Encoder</b>                                                      |                              |                                                           |                              |                                                           |                           |                                                |
| Connectable encoders                                                |                              |                                                           |                              |                                                           |                           |                                                |
| • 2-wire BEROs - permissible quiescent current (2-wire BEROs), max. | Yes<br>1.5 mA                | Yes<br>1.5 mA                                             | Yes<br>1.5 mA                | Yes<br>1.5 mA                                             | Yes<br>1.5 mA             | Yes<br>1.5 mA                                  |
| <b>Parameter</b>                                                    |                              |                                                           |                              |                                                           |                           |                                                |
| Remark                                                              | 1 byte                       | 3 byte                                                    | 1 byte                       | 3 byte                                                    | 1 byte                    | 3-byte parameter (not accessible for the user) |
| Diagnostics: short circuit                                          |                              | Disable/enable                                            |                              | Disable/enable                                            |                           |                                                |
| <b>Alarms/ diagnostics/status information</b>                       |                              |                                                           |                              |                                                           |                           |                                                |
| Diagnostics                                                         |                              |                                                           |                              |                                                           |                           |                                                |
| • Diagnostic functions                                              | No                           | Yes                                                       | No                           | Yes                                                       | No                        | No                                             |
| • Short circuit                                                     |                              | Yes; Short-circuit of outputs to ground; module by module |                              | Yes; Short-circuit of outputs to ground; module by module |                           |                                                |
| Diagnostic indication LED                                           |                              |                                                           |                              |                                                           |                           |                                                |
| • Group error SF (red)                                              | No                           | Yes                                                       | No                           | Yes                                                       | No                        |                                                |
| • Status indicator digital input (green)                            | Yes; per channel             | Yes; per channel                                          | Yes; per channel             | Yes; per channel                                          | Yes; per channel          | Yes                                            |

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## Technical specifications (continued)

|                                              | 6ES7 131-4BB01-0AA0 | 6ES7 131-4BB01-0AB0 | 6ES7 131-4BD01-0AA0 | 6ES7 131-4BD01-0AB0 | 6ES7 131-4BD51-0AA0 | 6ES7 131-4BF00-0AA0 |
|----------------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| <b>Isolation</b>                             |                     |                     |                     |                     |                     |                     |
| Isolation checked with                       | 500 V DC            | 500 V DC            | 500 V DC            | 500 V DC            | 500 V DC            | 500 V DC            |
| <b>Galvanic isolation</b>                    |                     |                     |                     |                     |                     |                     |
| Galvanic isolation digital inputs            |                     |                     |                     |                     |                     |                     |
| • between the channels                       | No                  | No                  | No                  | No                  | No                  | No                  |
| • between the channels and the backplane bus | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 |
| <b>Permissible potential difference</b>      |                     |                     |                     |                     |                     |                     |
| between different circuits                   | 75 V DC / 60 V AC   | 75 V DC / 60 V AC   | 75 V DC / 60 V AC   | 75 V DC / 60 V AC   | 75 V DC / 60 V AC   | 75 V DC / 60 V AC   |
| <b>Dimensions and weight</b>                 |                     |                     |                     |                     |                     |                     |
| Dimensions                                   |                     |                     |                     |                     |                     |                     |
| • Width                                      | 15 mm               | 15 mm               | 15 mm               | 15 mm               | 15 mm               | 15 mm               |
| • Height                                     | 81 mm               | 81 mm               | 81 mm               | 81 mm               | 81 mm               | 81 mm               |
| • Depth                                      | 52 mm               | 52 mm               | 52 mm               | 52 mm               | 52 mm               | 52 mm               |
| Weight                                       |                     |                     |                     |                     |                     |                     |
| • Weight, approx.                            | 35 g                | 35 g                | 35 g                | 35 g                | 35 g                | 35 g                |

|                                       | 6ES7 131-4RD02-0AB0     | 6ES7 131-4EB00-0AB0    | 6ES7 131-4FB00-0AB0  | 6ES7 131-4CD02-0AB0  | 6ES7 131-4BF50-0AA0    |
|---------------------------------------|-------------------------|------------------------|----------------------|----------------------|------------------------|
| <b>Supply voltages</b>                |                         |                        |                      |                      |                        |
| Rated value                           |                         |                        |                      |                      |                        |
| • 24 V DC                             | Yes; From power module  |                        |                      | Yes                  | Yes; from power module |
| • permissible range, lower limit (DC) | 24 V                    |                        |                      | 20.4 V               | 20.4 V                 |
| • permissible range, upper limit (DC) | 48 V                    |                        |                      | 28.8 V               | 28.8 V                 |
| • 24 V AC                             | Yes                     |                        |                      |                      |                        |
| • 120 V AC                            |                         | Yes; from power module |                      |                      |                        |
| • 230 V AC                            |                         |                        | Yes                  |                      |                        |
| • permissible range, lower limit (AC) | 24 V                    |                        |                      |                      |                        |
| • permissible range, upper limit (AC) | 48 V                    |                        |                      |                      |                        |
| • reverse polarity protection         | Yes; AC or DC automatic |                        |                      |                      | Yes                    |
| <b>Current consumption</b>            |                         |                        |                      |                      |                        |
| from backplane bus 3.3 V DC, max.     | 10 mA                   | 6 mA                   | 6 mA                 |                      |                        |
| from supply voltage L+, max.          | Dependent on encoder    |                        |                      | Dependent on encoder | Dependent on encoder   |
| from supply voltage L1, max.          |                         | Dependent on encoder   | Dependent on encoder |                      |                        |
| <b>Power losses</b>                   |                         |                        |                      |                      |                        |
| Power loss, typ.                      | 0.7 W                   | 0.5 W                  | 0.7 W                | 1.6 W                | 1.2 W                  |
| <b>Address area</b>                   |                         |                        |                      |                      |                        |
| Address space per module              |                         |                        |                      |                      |                        |
| • with packing                        | 4 bit                   | 2 bit                  | 2 bit                | 4 bit                |                        |
| • without packing                     | 1 byte                  | 1 byte                 | 1 byte               | 1 byte               |                        |
| <b>Isochronous mode</b>               |                         |                        |                      |                      |                        |
| Isochronous mode                      | Yes                     | No                     | No                   |                      | Yes                    |

**Technical specifications** (continued)

|                                                            | 6ES7 131-4RD02-0AB0                                                                  | 6ES7 131-4EB00-0AB0 | 6ES7 131-4FB00-0AB0 | 6ES7 131-4CD02-0AB0 | 6ES7 131-4BF50-0AA0 |
|------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|---------------------|
| <b>Digital inputs</b>                                      |                                                                                      |                     |                     |                     |                     |
| Number of digital inputs                                   | 4                                                                                    | 2                   | 2                   | 4                   | 8                   |
| Number of NAMUR inputs                                     |                                                                                      |                     |                     | 4                   |                     |
| Number of simultaneously controllable inputs               |                                                                                      |                     |                     | 4                   |                     |
| Parallel switching of inputs                               |                                                                                      |                     |                     | No                  |                     |
| Input characteristic curve acc. to IEC 1131, Type 1        | Yes                                                                                  | Yes                 | Yes                 |                     | Yes                 |
| Input voltage                                              |                                                                                      |                     |                     |                     |                     |
| • Rated value, AC                                          |                                                                                      | 120 V               | 230 V               |                     | 24 V                |
| • Rated value, DC                                          |                                                                                      |                     |                     |                     |                     |
| • Rated value, UC                                          | 24 V; 24 to 48 V UC                                                                  |                     |                     |                     |                     |
| • for signal "0"                                           | -6 to 6 V DC, 0 to 5 V AC                                                            | 0 to 20 V AC        | 0 to 40 V AC        |                     | 30 to -5 V          |
| • for signal "1"                                           | -15 to -57.6 V DC; -15 to 57.6 V DC; 15 to 48 V AC                                   | 79 to 132 V AC      | 164 to 264 V AC     |                     | -15 to -30 V        |
| • Frequency range                                          | 47 to 63 Hz                                                                          | 47 to 63 Hz         | 47 to 63 Hz         |                     |                     |
| Input current                                              |                                                                                      |                     |                     |                     |                     |
| • for signal "1", typ.                                     | 10 mA; 4 to 10 mA                                                                    | 3 mA; 3 to 9 mA     | 5 mA; 5 to 15 mA    |                     | 6 mA; at 24 V       |
| • for 10 k switched contact                                |                                                                                      |                     |                     |                     |                     |
| - for signal "0"                                           |                                                                                      |                     |                     | 0.35 to 1.2 mA      |                     |
| - for signal "1"                                           |                                                                                      |                     |                     | 2.1 to 7 mA         |                     |
| • for unswitched contact                                   |                                                                                      |                     |                     |                     |                     |
| - for signal "0", max. (permissible quiescent current)     |                                                                                      |                     |                     | 0.5 mA              |                     |
| - for signal "1"                                           |                                                                                      |                     |                     | typ. 8 mA           |                     |
| • for NAMUR encoders                                       |                                                                                      |                     |                     |                     |                     |
| - for signal "0"                                           |                                                                                      |                     |                     | 0.35 mA to 1.2 mA   |                     |
| - for signal "1"                                           |                                                                                      |                     |                     | 2.1 to 7 mA         |                     |
| Input delay (for rated value of input voltage)             |                                                                                      |                     |                     |                     |                     |
| • for standard inputs                                      |                                                                                      |                     |                     |                     |                     |
| - parameterizable                                          |                                                                                      |                     |                     |                     | No                  |
| - at "0" to "1", min.                                      |                                                                                      | 15 ms               | 15 ms               |                     | 2 ms                |
| - at "0" to "1", max.                                      | 15 ms                                                                                |                     |                     | 4.6 µs              | 4.5 ms              |
| - at "1" to "0", min.                                      |                                                                                      | 25 ms               | 45 ms               |                     | 2 ms                |
| - at "1" to "0", max.                                      | 15 ms                                                                                |                     |                     | 4.6 µs              | 4.5 ms              |
| Encoder connection                                         |                                                                                      |                     |                     |                     |                     |
| • Fixed current limitation for wire break monitoring, min. | 18 kΩ; Rated voltage 24 V (15 V to 35 V); rated voltage 48 V (30 V to 60 V); 39 kΩhm |                     |                     |                     |                     |
| Cable length                                               |                                                                                      |                     |                     |                     |                     |
| • Cable length, shielded, max.                             | 1 000 m                                                                              | 1 000 m             | 1 000 m             | 200 m               | 1 000 m             |
| • Cable length unshielded, max.                            | 600 m                                                                                | 600 m               | 600 m               |                     | 600 m               |
| <b>Encoder supply</b>                                      |                                                                                      |                     |                     |                     |                     |
| Number of outputs                                          |                                                                                      |                     |                     | 1                   |                     |
| Output voltage                                             | min. L+ (-0.5 V), under load                                                         |                     |                     | min. 8.2 V, loaded  |                     |



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## Technical specifications (continued)

|                                                      | 6ES7 131-4RD02-0AB0                                                                  | 6ES7 131-4EB00-0AB0 | 6ES7 131-4FB00-0AB0 | 6ES7 131-4CD02-0AB0   | 6ES7 131-4BF50-0AA0 |
|------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|---------------------|-----------------------|---------------------|
| Output current, rated value                          | 500 mA                                                                               |                     |                     | 45 mA                 |                     |
| Output current, permissible range                    | 0 to 500 mA                                                                          |                     |                     |                       |                     |
| Short-circuit protection                             | Yes; per module                                                                      |                     |                     | Yes; electronic       |                     |
| <b>Encoder</b>                                       |                                                                                      |                     |                     |                       |                     |
| Connectable encoders                                 |                                                                                      |                     |                     |                       |                     |
| • 2-wire BEROs                                       | Yes                                                                                  | No                  | No                  |                       | Yes                 |
| - permissible quiescent current (2-wire BEROs), max. | 2 mA; (0.5 to 2 mA), a minimum load current is necessary for wire break diagnostics. | 1 mA                | 2 mA                |                       | 1.5 mA              |
| <b>Parameter</b>                                     |                                                                                      |                     |                     |                       |                     |
| Remark                                               |                                                                                      | 3 byte              | 3 byte              | 12 byte               | 3 byte              |
| <b>Alarms/diagnostics/status information</b>         |                                                                                      |                     |                     |                       |                     |
| Alarms                                               |                                                                                      |                     |                     |                       |                     |
| • Diagnostic alarm                                   |                                                                                      |                     |                     | Yes; adjusted         |                     |
| • Process alarm                                      |                                                                                      |                     |                     | No                    |                     |
| Diagnostics                                          |                                                                                      |                     |                     |                       |                     |
| • Diagnostic functions                               | Yes; parameterizable                                                                 | No                  | No                  | Yes; diagnostic alarm | No                  |
| • Diagnostic information readable                    |                                                                                      |                     |                     | Yes                   |                     |
| • Short circuit                                      |                                                                                      | No                  | No                  |                       |                     |
| Diagnostic indication LED                            |                                                                                      |                     |                     |                       |                     |
| • Group error SF (red)                               | Yes                                                                                  |                     |                     | Yes                   | No                  |
| • Status indicator digital input (green)             | Yes; per channel                                                                     | Yes; per channel    | Yes; per channel    | Yes; per channel      | Yes; per channel    |
| <b>Isolation</b>                                     |                                                                                      |                     |                     |                       |                     |
| Isolation checked with                               | 2500 V DC                                                                            | 2500 V DC           | 4000 V DC           | 500 V DC              | 500 V DC            |
| <b>Galvanic isolation</b>                            |                                                                                      |                     |                     |                       |                     |
| Galvanic isolation digital inputs                    |                                                                                      |                     |                     |                       |                     |
| • between the channels                               | No                                                                                   | No                  | No                  | No                    | No                  |
| • between the channels and the backplane bus         | Yes                                                                                  | Yes                 | Yes                 | Yes                   | Yes                 |
| • between the channels and the load voltage L+       |                                                                                      |                     |                     | Yes                   |                     |
| <b>Permissible potential difference</b>              |                                                                                      |                     |                     |                       |                     |
| between different circuits                           | 75 V DC / 60 V AC                                                                    |                     |                     | 75 V DC / 60 V AC     | 75 V DC / 60 V AC   |
| between M internally and the inputs                  |                                                                                      | 1500 V AC           | 1500 V AC           |                       |                     |
| <b>Dimensions and weight</b>                         |                                                                                      |                     |                     |                       |                     |
| Dimensions                                           |                                                                                      |                     |                     |                       |                     |
| • Width                                              | 15 mm                                                                                | 15 mm               | 15 mm               | 15 mm                 | 15 mm               |
| • Height                                             | 81 mm                                                                                | 81 mm               | 81 mm               | 81 mm                 | 81 mm               |
| • Depth                                              | 52 mm                                                                                | 52 mm               | 52 mm               | 52 mm                 | 52 mm               |
| Weight                                               |                                                                                      |                     |                     |                       |                     |
| • Weight, approx.                                    | 35 g                                                                                 | 31 g                | 31 g                | 35 g                  | 35 g                |

## Technical specifications (continued)

|                                                         | 6ES7 132-4BB01-0AB0                                                            | 6ES7 132-4BB01-0AA0                                                            | 6ES7 132-4BB31-0AB0                                                            | 6ES7 132-4BB31-0AA0                                                            | 6ES7 132-4BD00-0AB0                                                            | 6ES7 132-4BD02-0AA0                                                            |
|---------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>Supply voltages</b>                                  |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |
| Reverse voltage protection                              | Yes; when using the same load voltage as on the power module                   | Yes; when using the same load voltage as on the power module                   | Yes; when using the same load voltage as on the power module                   | Yes; when using the same load voltage as on the power module                   | Yes; when using the same load voltage as on the power module                   | Yes; when using the same load voltage as on the power module                   |
| Load voltage L+                                         |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |
| • Rated value (DC)                                      | 24 V; from power module                                                        | 24 V; from power module                                                        | 24 V; from power module                                                        | 24 V; from power module                                                        | 24 V; from power module                                                        | 24 V; from PM                                                                  |
| • Reverse polarity protection                           | Yes; polarity reversal can lead to the digital outputs being connected through | Yes; polarity reversal can lead to the digital outputs being connected through | Yes; polarity reversal can lead to the digital outputs being connected through | Yes; polarity reversal can lead to the digital outputs being connected through | Yes; polarity reversal can lead to the digital outputs being connected through | Yes; polarity reversal can lead to the digital outputs being connected through |
| <b>Current consumption</b>                              |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |
| from load voltage L+ (without load), max.               | 5 mA; per channel                                                              | 5 mA; per module                                                               | 5 mA; per channel                                                              | 5 mA; per channel                                                              | 5 mA; per channel                                                              | 10 mA; per channel                                                             |
| from backplane bus 3.3 V DC, max.                       | 10 mA                                                                          | 10 mA                                                                          | 10 mA                                                                          | 10 mA                                                                          | 10 mA                                                                          | 10 mA                                                                          |
| <b>Power losses</b>                                     |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |
| Power loss, typ.                                        | 0.4 W                                                                          | 0.4 W                                                                          | 1.4 W                                                                          | 1.4 W                                                                          |                                                                                | 0.8 W                                                                          |
| <b>Address area</b>                                     |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |
| Address space per module                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |
| • with packing                                          | 2 bit                                                                          | 2 bit                                                                          | 2 bit                                                                          | 2 bit                                                                          | 4 bit                                                                          | 4 bit                                                                          |
| • without packing                                       | 1 byte                                                                         | 1 byte                                                                         | 1 byte                                                                         | 1 byte                                                                         | 1 byte                                                                         | 1 byte                                                                         |
| <b>Isochronous mode</b>                                 |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |
| Isochronous mode                                        | Yes                                                                            | No                                                                             | Yes                                                                            | No                                                                             | Yes                                                                            | Yes                                                                            |
| <b>Digital inputs</b>                                   |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |
| Cable length                                            |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |
| • Cable length, shielded, max.                          |                                                                                |                                                                                |                                                                                |                                                                                | 1 000 m                                                                        |                                                                                |
| • Cable length unshielded, max.                         |                                                                                |                                                                                |                                                                                |                                                                                | 600 m                                                                          |                                                                                |
| <b>Digital outputs</b>                                  |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |
| Number of digital outputs                               | 2                                                                              | 2                                                                              | 2                                                                              | 2                                                                              | 4                                                                              | 4                                                                              |
| Short-circuit protection                                | Yes; per channel                                                               | Yes; per channel                                                               | Yes; per channel                                                               | Yes; per channel                                                               | Yes; per channel                                                               | Yes; per channel                                                               |
| • Response threshold, typ.                              | 1.5 A                                                                          | 0.7 to 1.8 A                                                                   | 4 A                                                                            | 2.8 to 7.2 A                                                                   | 0.7 to 1.5 A                                                                   | 1 to 1.5 A                                                                     |
| Limitation of inductive shutdown voltage to             | -55 to -60 V, typ. L+( )                                                       | -55 to -60 V, typ. L+( )                                                       | -55 to -60 V, typ. L+( )                                                       | -55 to -60 V, typ. L+( )                                                       | -55 to -60 V, L+( )                                                            | (L+)-55 to -60 V                                                               |
| Lamp load, max.                                         | 2.5 W                                                                          | 5 W                                                                            | 5 W                                                                            | 10 W                                                                           | 5 W                                                                            | 5 W                                                                            |
| Controlling a digital input                             | Yes                                                                            | Yes                                                                            | Yes                                                                            | Yes                                                                            | Yes                                                                            | Yes                                                                            |
| Output voltage                                          |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |
| • for signal "1", min.                                  | L+ (-1 V)                                                                      | L+ (-1 V)                                                                      | L+ (-1 V)                                                                      | L+ (-1 V)                                                                      | L+ (-1 V)                                                                      | L+ (-1 V)                                                                      |
| Output current                                          |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |                                                                                |
| • for signal "1" rated value                            | 0.5 A                                                                          | 0.5 A                                                                          | 2 A                                                                            | 2 A                                                                            | 0.5 A                                                                          | 0.5 A                                                                          |
| • for signal "1" permissible range for 0 to 60 °C, min. | 7 mA                                                                           | 7 mA                                                                           | 7 mA                                                                           | 7 mA                                                                           | 7 mA                                                                           | 7 mA                                                                           |
| • for signal "1" permissible range for 0 to 60 °C, max. | 600 mA                                                                         | 600 mA                                                                         | 2.4 A                                                                          | 2.4 A                                                                          | 600 mA                                                                         | 600 mA                                                                         |
| • for signal "0" residual current, max.                 | 0.3 mA                                                                         | 0.3 mA                                                                         | 0.5 mA                                                                         | 0.5 mA                                                                         | 0.3 mA                                                                         | 0.3 mA                                                                         |

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## Technical specifications (continued)

|                                                                 | 6ES7 132-4BB01-0AB0                  | 6ES7 132-4BB01-0AA0 | 6ES7 132-4BB31-0AB0                  | 6ES7 132-4BB31-0AA0 | 6ES7 132-4BD00-0AB0 | 6ES7 132-4BD02-0AA0  |
|-----------------------------------------------------------------|--------------------------------------|---------------------|--------------------------------------|---------------------|---------------------|----------------------|
| Output delay with resistive load<br>• 0 to "1", max.            | 100 µs                               | 200 µs              | 100 µs                               | 200 µs              | 100 µs              | 45 µs; typical value |
| • 1 to "0", max.                                                | 400 µs                               | 1.3 ms              | 400 µs                               | 1.3 ms              | 300 µs              | 90 µs; typical value |
| Parallel switching of 2 outputs<br>• for increased power        | No                                   | No                  | No                                   | No                  | No                  | No                   |
| • for redundant control of a load                               | Yes; per module                      | Yes; per module     | Yes; per module                      | Yes; per module     | Yes; per module     | Yes; per module      |
| Switching frequency<br>• with resistive load, max.              | 100 Hz                               | 100 Hz              | 100 Hz                               | 100 Hz              | 100 Hz              | 800 Hz               |
| • with inductive load, max.                                     | 2 Hz                                 | 2 Hz                | 2 Hz; 0.5 H                          | 2 Hz; 0.5 H         | 2 Hz                | 2 Hz                 |
| • on lamp load, max.                                            | 10 Hz                                | 10 Hz               | 10 Hz                                | 10 Hz               | 10 Hz               | 10 Hz                |
| Aggregate current of outputs (per group)<br>• up to 60 °C, max. | 1 A                                  | 1 A                 | 4 A                                  | 4 A                 | 2 A                 | 2 A                  |
| Load resistance range<br>• lower limit                          | 48 Ω                                 | 48 Ω                | 12 Ω                                 | 12 Ω                | 48 Ω                | 48 Ω                 |
| • upper limit                                                   | 3 400 Ω                              | 3 400 Ω             | 3 400 Ω                              | 3 400 Ω             | 3 400 Ω             | 3 400 Ω              |
| Cable length<br>• Cable length, shielded, max.                  | 1 000 m                              | 1 000 m             | 1 000 m                              | 1 000 m             | 1 000 m             | 1 000 m              |
| • Cable length unshielded, max.                                 | 600 m                                | 600 m               | 600 m                                | 600 m               | 600 m               | 600 m                |
| <b>Parameter</b>                                                |                                      |                     |                                      |                     |                     |                      |
| Remark                                                          | 3 byte                               | 1 byte              | 3 byte                               | 1 byte              |                     | 1 byte               |
| Diagnostics: wire break                                         | Disable/enable                       |                     | Disable/enable                       |                     |                     |                      |
| Diagnostics: short circuit                                      | Disable/enable                       |                     | Disable/enable                       |                     |                     |                      |
| Behavior on CPU/Master STOP, channel-wise                       | Substitute a value / keep last value |                     | Substitute a value / keep last value |                     |                     |                      |
| <b>Alarms/diagnostics/status information</b>                    |                                      |                     |                                      |                     |                     |                      |
| Substitute values connectable                                   | Yes; 0/1                             |                     | Yes; 0/1                             |                     |                     |                      |
| Diagnostics<br>• Diagnostic functions                           | Yes; can be read out                 | No                  | Yes; can be read out                 | No                  | Yes                 | No                   |
| • Wire break                                                    | Yes; channel by channel              |                     | Yes; channel by channel              |                     |                     |                      |
| • Short circuit                                                 | Yes; channel by channel              |                     | Yes; channel by channel              |                     | Yes; module-wise    |                      |
| Diagnostic indication LED<br>• Group error SF (red)             | Yes                                  |                     | Yes                                  |                     | Yes; SF-LED (red)   |                      |
| • Status indicator digital output (green)                       | Yes                                  | Yes                 | Yes                                  | Yes                 | Yes; per channel    | Yes                  |
| <b>Isolation</b>                                                |                                      |                     |                                      |                     |                     |                      |
| Isolation checked with                                          | 500 V DC                             | 500 V DC            | 500 V DC                             | 500 V DC            | 500 V DC            | 500 V DC             |

## Technical specifications (continued)

|                                              | 6ES7 132-4BB01-0AB0 | 6ES7 132-4BB01-0AA0 | 6ES7 132-4BB31-0AB0 | 6ES7 132-4BB31-0AA0 | 6ES7 132-4BD00-0AB0 | 6ES7 132-4BD02-0AA0 |
|----------------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| <b>Galvanic isolation</b>                    |                     |                     |                     |                     |                     |                     |
| Galvanic isolation digital outputs           |                     |                     |                     |                     |                     |                     |
| • between the channels                       | No                  | No                  | No                  | No                  | No                  | No                  |
| • between the channels and the backplane bus | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 |
| <b>Dimensions and weight</b>                 |                     |                     |                     |                     |                     |                     |
| Dimensions                                   |                     |                     |                     |                     |                     |                     |
| • Width                                      | 15 mm               | 15 mm               | 15 mm               | 15 mm               | 15 mm               | 15 mm               |
| • Height                                     | 81 mm               | 81 mm               | 81 mm               | 81 mm               | 81 mm               | 81 mm               |
| • Depth                                      | 52 mm               | 52 mm               | 52 mm               | 52 mm               | 52 mm               | 52 mm               |
| Weight                                       |                     |                     |                     |                     |                     |                     |
| • Weight, approx.                            | 40 g                | 40 g                | 40 g                | 40 g                | 40 g                | 40 g                |

|                                                         | 6ES7 132-4BF00-0AB0                                                            | 6ES7 132-4BF00-0AA0            |
|---------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------|
| <b>Supply voltages</b>                                  |                                                                                |                                |
| Reverse voltage protection                              | Yes; when using the same load voltage as on the power module                   | Yes                            |
| Load voltage L+                                         |                                                                                |                                |
| • Rated value (DC)                                      | 24 V; from power module                                                        | 24 V                           |
| • Reverse polarity protection                           | Yes; polarity reversal can lead to the digital outputs being connected through | Yes                            |
| <b>Current consumption</b>                              |                                                                                |                                |
| from load voltage L+ (without load), max.               | 5 mA; per channel                                                              | 5 mA; per channel              |
| from backplane bus 3.3 V DC, max.                       | 10 mA                                                                          | 10 mA                          |
| <b>Power losses</b>                                     |                                                                                |                                |
| Power loss, typ.                                        |                                                                                | 1.5 W                          |
| <b>Address area</b>                                     |                                                                                |                                |
| Address space per module                                |                                                                                |                                |
| • with packing                                          | not relevant                                                                   |                                |
| • without packing                                       | 1 byte                                                                         | 1 byte                         |
| <b>Isochronous mode</b>                                 |                                                                                |                                |
| Isochronous mode                                        | Yes                                                                            | Yes; jitter incumbered < 100us |
| <b>Digital inputs</b>                                   |                                                                                |                                |
| Cable length                                            |                                                                                |                                |
| • Cable length, shielded, max.                          | 1 000 m                                                                        | 1 000 m                        |
| • Cable length unshielded, max.                         | 600 m                                                                          | 600 m                          |
| <b>Digital outputs</b>                                  |                                                                                |                                |
| Number of digital outputs                               | 8                                                                              | 8                              |
| Short-circuit protection                                | Yes; per channel                                                               | Yes; per channel               |
| • Response threshold, typ.                              | 0.7 to 1.9 A                                                                   | o.k.                           |
| Limitation of inductive shutdown voltage to             | L+ -(47 to 60 V)                                                               | o.k.                           |
| Lamp load, max.                                         | 5 W                                                                            | 5 W                            |
| Controlling a digital input                             | Yes                                                                            | Yes                            |
| Output voltage                                          |                                                                                |                                |
| • for signal "1", min.                                  | L+ (-1.0 V)                                                                    | o.k.                           |
| Output current                                          |                                                                                |                                |
| • for signal "1" rated value                            | 0.5 A                                                                          | 0.5 A                          |
| • for signal "1" permissible range for 0 to 60 °C, min. | 7 mA                                                                           | 7 mA                           |
| • for signal "1" permissible range for 0 to 60 °C, max. | 600 mA                                                                         | 600 mA                         |
| • for signal "0" residual current, max.                 | 0.3 mA                                                                         | 0.3 mA                         |

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## I/O modules

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## Technical specifications (continued)

|                                              | 6ES7 132-4BF00-0AB0     | 6ES7 132-4BF00-0AA0                            |
|----------------------------------------------|-------------------------|------------------------------------------------|
| Output delay with resistive load             |                         |                                                |
| • 0 to "1", max.                             | 300 µs                  | 300 µs                                         |
| • 1 to "0", max.                             | 600 µs                  | 600 µs                                         |
| Parallel switching of 2 outputs              |                         |                                                |
| • for increased power                        | No                      | No                                             |
| • for redundant control of a load            | Yes; per module         | Yes                                            |
| Switching frequency                          |                         |                                                |
| • with resistive load, max.                  | 100 Hz                  | 100 Hz                                         |
| • with inductive load, max.                  | 2 Hz                    | 2 Hz                                           |
| • on lamp load, max.                         | 10 Hz                   | 10 Hz                                          |
| Aggregate current of outputs (per group)     |                         |                                                |
| • horizontal installation                    |                         |                                                |
| - up to 60 °C, max.                          | 4 A                     |                                                |
| • vertical installation                      |                         |                                                |
| - up to 40 °C, max.                          | 4 A; at 55°C and 24V DC |                                                |
| • up to 60 °C, max.                          |                         | 4 A                                            |
| Load resistance range                        |                         |                                                |
| • lower limit                                | 48 Ω                    | 48 Ω                                           |
| • upper limit                                | 3 400 Ω                 | 3 400 Ω                                        |
| Cable length                                 |                         |                                                |
| • Cable length, shielded, max.               | 1 000 m                 | 1 000 m                                        |
| • Cable length unshielded, max.              | 600 m                   | 600 m                                          |
| <b>Parameter</b>                             |                         |                                                |
| Remark                                       | 1 byte                  | 3-byte parameter (not accessible for the user) |
| <b>Alarms/diagnostics/status information</b> |                         |                                                |
| Diagnostics                                  |                         |                                                |
| • Diagnostic functions                       | Yes                     | No                                             |
| • Short circuit                              | Yes; module-wise        |                                                |
| Diagnostic indication LED                    |                         |                                                |
| • Group error SF (red)                       | Yes; SF-LED (red)       |                                                |
| • Status indicator digital output (green)    | Yes; per channel        | Yes                                            |
| <b>Isolation</b>                             |                         |                                                |
| Isolation checked with                       | 500 V DC                | 500 V DC                                       |
| <b>Galvanic isolation</b>                    |                         |                                                |
| Galvanic isolation digital outputs           |                         |                                                |
| • between the channels                       | No                      | No                                             |
| • between the channels and the backplane bus | Yes                     | Yes                                            |
| <b>Dimensions and weight</b>                 |                         |                                                |
| Dimensions                                   |                         |                                                |
| • Width                                      | 15 mm                   | 15 mm                                          |
| • Height                                     | 81 mm                   | 81 mm                                          |
| • Depth                                      | 52 mm                   | 52 mm                                          |
| Weight                                       |                         |                                                |
| • Weight, approx.                            | 40 g                    | 40 g                                           |

## Technical specifications (continued)

|                                                         | 6ES7 132-4BB30-0AB0                                          | 6ES7 132-4BD32-0AA0                                          | 6ES7 132-4FB01-0AB0                                          | 6ES7 132-4HB01-0AB0                      | 6ES7 132-4HB12-0AB0                      |
|---------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------|------------------------------------------|
| <b>Supply voltages</b>                                  |                                                              |                                                              |                                                              |                                          |                                          |
| Reverse voltage protection                              | Yes; when using the same load voltage as on the power module | Yes; when using the same load voltage as on the power module | Yes; when using the same load voltage as on the power module |                                          |                                          |
| Load voltage L+                                         |                                                              |                                                              |                                                              |                                          |                                          |
| • Rated value (DC)                                      | 24 V; from power module                                      | 24 V; from power module                                      | 24 V; from power module                                      | 24 V; from power module                  | 24 V; from power module                  |
| • Reverse polarity protection                           | Yes                                                          | Yes                                                          | Yes                                                          | Yes                                      | Yes                                      |
| <b>Current consumption</b>                              |                                                              |                                                              |                                                              |                                          |                                          |
| from load voltage L+ (without load), max.               | 5 mA; per channel                                            | 10 mA; per channel                                           | 30 mA                                                        | 30 mA                                    | 30 mA                                    |
| from backplane bus 3.3 V DC, max.                       | 10 mA                                                        | 10 mA                                                        | 18 mA                                                        | 10 mA                                    | 10 mA                                    |
| <b>Power losses</b>                                     |                                                              |                                                              |                                                              |                                          |                                          |
| Power loss, typ.                                        | 1.4 W                                                        | 1.6 W                                                        | 4 W                                                          | 0.6 W                                    | 0.6 W                                    |
| <b>Address area</b>                                     |                                                              |                                                              |                                                              |                                          |                                          |
| Address space per module                                |                                                              |                                                              |                                                              |                                          |                                          |
| • with packing                                          | 2 bit                                                        | 4 bit                                                        | 2 bit                                                        | 2 bit                                    | 2 bit                                    |
| • without packing                                       | 1 byte                                                       | 1 byte                                                       | 1 byte                                                       | 1 byte                                   | 1 byte                                   |
| <b>Isochronous mode</b>                                 |                                                              |                                                              |                                                              |                                          |                                          |
| Isochronous mode                                        | Yes                                                          | Yes                                                          |                                                              | No                                       | No                                       |
| <b>Digital outputs</b>                                  |                                                              |                                                              |                                                              |                                          |                                          |
| Number of digital outputs                               | 2                                                            | 4                                                            | 2                                                            | 2                                        | 2                                        |
| Short-circuit protection                                | Yes; per channel                                             | Yes; per channel                                             | Yes; via fuse in power module                                | No; external fuse, max. 6 A quick-acting | No; external fuse, max. 6 A quick-acting |
| • Response threshold, typ.                              | 4 A                                                          | 2.8 to 7.2 A                                                 |                                                              |                                          |                                          |
| Limitation of inductive shutdown voltage to             | -55 to -60 V                                                 | Typ. L+ (-55 to -60 V)                                       | -55 to -60 V                                                 | No                                       | No                                       |
| Lamp load, max.                                         | 5 W                                                          | 10 W                                                         | 100 W                                                        |                                          |                                          |
| Controlling a digital input                             | Yes                                                          | Yes                                                          | Yes; possible                                                | Yes                                      | Yes                                      |
| Output voltage                                          |                                                              |                                                              |                                                              |                                          |                                          |
| • for signal "1", min.                                  | L+ (-1 V)                                                    | L+ (-1.0 V)                                                  | L+ (-1.5 V)                                                  |                                          |                                          |
| Output current                                          |                                                              |                                                              |                                                              |                                          |                                          |
| • for signal "1" rated value                            | 2 A                                                          | 2 A                                                          | 2 A                                                          | 5 A                                      | 5 A                                      |
| • for signal "1" permissible range for 0 to 60 °C, min. | 7 mA                                                         | 7 mA                                                         | 0.1 mA                                                       |                                          |                                          |
| • for signal "1" permissible range for 0 to 60 °C, max. | 2.4 A                                                        | 2.4 A                                                        | 2.2 A                                                        |                                          |                                          |
| • for signal "1" minimum load current                   |                                                              |                                                              |                                                              | 8 mA                                     | 8 mA                                     |
| • for signal "0" residual current, max.                 | 0.5 mA                                                       | 0.5 mA                                                       | 3 mA                                                         |                                          |                                          |
| Output delay with resistive load                        |                                                              |                                                              |                                                              |                                          |                                          |
| • 0 to "1", max.                                        | 100 µs                                                       | 50 µs; typically 45µs                                        | 15 ms                                                        |                                          |                                          |
| • 1 to "0", max.                                        | 400 µs                                                       | 120 µs; typically 90µs                                       | 15 ms                                                        |                                          |                                          |
| Parallel switching of 2 outputs                         |                                                              |                                                              |                                                              |                                          |                                          |
| • for increased power                                   | No                                                           | No                                                           | No                                                           | No                                       | No                                       |
| • for redundant control of a load                       | Yes; per module                                              | Yes; per module                                              | Yes; per module                                              | No                                       | No                                       |

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## Technical specifications (continued)

|                                                      | 6ES7 132-4BB30-0AB0                     | 6ES7 132-4BD32-0AA0     | 6ES7 132-4FB01-0AB0                     | 6ES7 132-4HB01-0AB0                  | 6ES7 132-4HB12-0AB0 |
|------------------------------------------------------|-----------------------------------------|-------------------------|-----------------------------------------|--------------------------------------|---------------------|
| Switching frequency                                  |                                         |                         |                                         |                                      |                     |
| • with resistive load, max.                          | 100 Hz                                  | 1 000 Hz                | 10 Hz                                   | 2 Hz                                 | 2 Hz                |
| • with inductive load, max.                          | 2 Hz; 0.5 H                             | 2 Hz; at 0.5H           | 0.5 Hz                                  | 0.5 Hz                               | 0.5 Hz              |
| • on lamp load, max.                                 | 10 Hz                                   | 10 Hz                   | 1 Hz                                    | 2 Hz                                 | 2 Hz                |
| Aggregate current of outputs (per group)             |                                         |                         |                                         |                                      |                     |
| • vertical installation<br>- up to 40 °C, max.       |                                         | 4 A; at 55°C and 24V DC |                                         |                                      |                     |
| • up to 40 °C, max.                                  |                                         |                         | 2 A                                     |                                      |                     |
| • up to 50 °C, max.                                  |                                         |                         | 1.5 A                                   |                                      |                     |
| • up to 60 °C, max.                                  | 4 A                                     | 4 A                     | 1 A                                     |                                      |                     |
| Load resistance range                                |                                         |                         |                                         |                                      |                     |
| • lower limit                                        | 12 Ω                                    | 12 Ω                    |                                         |                                      |                     |
| • upper limit                                        | 3 400 Ω                                 | 3 400 Ω                 |                                         |                                      |                     |
| Cable length                                         |                                         |                         |                                         |                                      |                     |
| • Cable length, shielded, max.                       | 1 000 m                                 | 1 000 m                 | 1 000 m                                 | 1 000 m                              | 1 000 m             |
| • Cable length unshielded, max.                      | 600 m                                   | 600 m                   | 600 m                                   | 600 m                                | 600 m               |
| <b>Relay outputs</b>                                 |                                         |                         |                                         |                                      |                     |
| Switching capacity of contacts                       |                                         |                         |                                         |                                      |                     |
| • Thermal continuous current, max.                   |                                         |                         |                                         | 5 A                                  | 5 A                 |
| <b>Parameter</b>                                     |                                         |                         |                                         |                                      |                     |
| Remark                                               | 3 byte                                  | 1 byte                  | 3 byte                                  | 3 byte                               | 3 byte              |
| Diagnostics: wire break                              | Disable/enable                          |                         |                                         |                                      |                     |
| Diagnostics: short circuit                           | Disable / enable                        |                         |                                         |                                      |                     |
| Behavior on CPU/Master STOP, channel-wise            | Substitute a value/keep last value, 0/1 |                         | Substitute a value/keep last value, 0/1 | Substitute a value / keep last value |                     |
| <b>Alarms/diagnostics/status information</b>         |                                         |                         |                                         |                                      |                     |
| Substitute values connectable                        | Yes; 0/1                                |                         |                                         | Yes; 0/1                             | Yes; 0/1            |
| Diagnostics                                          |                                         |                         |                                         |                                      |                     |
| • Diagnostic functions                               | Yes; can be read out                    | No                      | No                                      | No                                   | No                  |
| • Wire break                                         | Yes; channel by channel                 |                         |                                         |                                      |                     |
| • Short circuit                                      | Yes; channel by channel                 |                         |                                         |                                      |                     |
| Diagnostic indication LED                            |                                         |                         |                                         |                                      |                     |
| • Group error SF (red)                               | Yes                                     |                         |                                         |                                      |                     |
| • Status indicator digital output (green)            | Yes                                     | Yes                     | Yes                                     | Yes                                  | Yes                 |
| <b>Isolation</b>                                     |                                         |                         |                                         |                                      |                     |
| Isolation checked with                               | 500 V DC                                | 500 V DC                | 2500 V DC                               |                                      |                     |
| tested with                                          |                                         |                         |                                         |                                      |                     |
| • Channels against backplane bus and load voltage L+ |                                         |                         |                                         | 1500 V AC                            | 2500 V DC           |
| • Load voltage L+ against backplane bus              |                                         |                         |                                         | 500 V DC                             | 500 V DC            |

## Technical specifications (continued)

|                                                                       | 6ES7 132-4BB30-0AB0 | 6ES7 132-4BD32-0AA0 | 6ES7 132-4FB01-0AB0 | 6ES7 132-4HB01-0AB0 | 6ES7 132-4HB12-0AB0 |
|-----------------------------------------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| <b>Galvanic isolation</b><br>Galvanic isolation digital outputs       |                     |                     |                     |                     |                     |
| • between the channels                                                | No                  | No                  | No                  | Yes                 | Yes                 |
| • between the channels and the backplane bus                          | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 |
| • between the channels and the load voltage L+                        |                     |                     |                     | Yes                 | Yes                 |
| <b>Permissible potential difference</b><br>between different circuits | 75 V DC / 60 V AC   |                     |                     |                     |                     |
| <b>Dimensions and weight</b><br>Dimensions                            |                     |                     |                     |                     |                     |
| • Width                                                               | 15 mm               | 15 mm               | 15 mm               | 15 mm               | 15 mm               |
| • Height                                                              | 81 mm               | 81 mm               | 81 mm               | 81 mm               | 81 mm               |
| • Depth                                                               | 52 mm               | 52 mm               | 52 mm               | 52 mm               | 52 mm               |
| <b>Weight</b><br>• Weight, approx.                                    | 40 g                | 40 g                | 37 g                | 50 g                | 50 g                |

|                                                                         | 6ES7 132-4BF50-0AA0                                                              | 6ES7 132-4BD50-0AA0                      |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------|
| <b>Supply voltages</b><br>Reverse voltage protection                    | Yes; when using the same correctly polarized load voltage as on the power module | Yes; when using the same load voltage as |
| Load voltage L+                                                         |                                                                                  |                                          |
| • Rated value (DC)                                                      | 24 V; from power module                                                          | 24 V; from power module                  |
| • Reverse polarity protection                                           | Yes                                                                              | Yes                                      |
| <b>Current consumption</b><br>from load voltage L+ (without load), max. | 5 mA                                                                             | 5 mA; per channel                        |
| from backplane bus 3.3 V DC, max.                                       | 10 mA                                                                            | 10 mA                                    |
| <b>Power losses</b><br>Power loss, typ.                                 | 1.5 W                                                                            | 0.8 W                                    |
| <b>Address area</b><br>Address space per module                         |                                                                                  |                                          |
| • with packing                                                          |                                                                                  | 4 bit                                    |
| • without packing                                                       | 1 byte                                                                           | 1 byte                                   |
| <b>Isochronous mode</b><br>Isochronous mode                             | Yes                                                                              | Yes                                      |
| <b>Digital inputs</b><br>Cable length                                   |                                                                                  |                                          |
| • Cable length, shielded, max.                                          |                                                                                  | 1 000 m                                  |
| • Cable length unshielded, max.                                         |                                                                                  | 600 m                                    |
| <b>Digital outputs</b><br>Number of digital outputs                     | 8                                                                                | 4                                        |
| Short-circuit protection                                                | Yes; per channel                                                                 | Yes; per channel                         |
| • Response threshold, typ.                                              | 1.5 A                                                                            |                                          |
| Limitation of inductive shutdown voltage to                             | Typ. 47 V                                                                        |                                          |
| Lamp load, max.                                                         | 5 W                                                                              | 5 W                                      |
| Controlling a digital input                                             | Yes                                                                              | Yes                                      |



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## Technical specifications (continued)

|                                                                                                                                                                                                                 | 6ES7 132-4BF50-0AA0             | 6ES7 132-4BD50-0AA0             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|
| Output voltage<br>• for signal "1", min.                                                                                                                                                                        | Max. 1 V                        | 1 V                             |
| Output current<br>• for signal "1" rated value<br>• for signal "1" permissible range for 0 to 60 °C, min.<br>• for signal "1" permissible range for 0 to 60 °C, max.<br>• for signal "0" residual current, max. | 0.5 A<br>5 mA<br>700 mA<br>5 µA | 0.5 A<br>5 mA<br>700 mA<br>5 µA |
| Output delay with resistive load<br>• 0 to "1", max.<br>• 1 to "0", max.                                                                                                                                        | 300 µs<br>600 µs                | 300 µs<br>600 µs                |
| Parallel switching of 2 outputs<br>• for increased power<br>• for redundant control of a load                                                                                                                   | No<br>Yes; per module           | No<br>Yes; per module           |
| Switching frequency<br>• with resistive load, max.<br>• with inductive load, max.<br>• on lamp load, max.                                                                                                       | 100 Hz<br>0.5 Hz<br>10 Hz       | 100 Hz<br>0.5 Hz<br>10 Hz       |
| Aggregate current of outputs (per group)<br>• up to 60 °C, max.                                                                                                                                                 | 4 A                             | 2 A                             |
| Load resistance range<br>• lower limit<br>• upper limit                                                                                                                                                         | 48 Ω<br>3 400 Ω                 | 48 Ω<br>3 400 Ω                 |
| Cable length<br>• Cable length, shielded, max.<br>• Cable length unshielded, max.                                                                                                                               | 1 000 m<br>600 m                |                                 |
| <b>Parameter</b>                                                                                                                                                                                                |                                 |                                 |
| Remark                                                                                                                                                                                                          | 3 byte                          | 1 byte                          |
| <b>Alarms/diagnostics/status information</b>                                                                                                                                                                    |                                 |                                 |
| Diagnostics<br>• Diagnostic functions                                                                                                                                                                           | No                              | No                              |
| Diagnostic indication LED<br>• Status indicator digital output (green)                                                                                                                                          | Yes                             | Yes                             |
| <b>Isolation</b>                                                                                                                                                                                                |                                 |                                 |
| Isolation checked with                                                                                                                                                                                          | 500 V DC                        | 500 V DC                        |
| <b>Galvanic isolation</b>                                                                                                                                                                                       |                                 |                                 |
| Galvanic isolation digital outputs<br>• between the channels<br>• between the channels and the backplane bus                                                                                                    | No<br>Yes                       | No<br>Yes                       |
| <b>Dimensions and weight</b>                                                                                                                                                                                    |                                 |                                 |
| Dimensions<br>• Width<br>• Height<br>• Depth                                                                                                                                                                    | 15 mm<br>81 mm<br>52 mm         | 15 mm<br>81 mm<br>52 mm         |
| Weight<br>• Weight, approx.                                                                                                                                                                                     | 40 g                            | 40 g                            |

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Order No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Order No.                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Digital input modules</b><br>Ordering unit 5 units<br>• 2 DI 24 V DC Standard<br>• 2 DI 24 V DC High Feature<br>• 4 DI 24 V DC Standard<br>• 4 DI 24 V DC High Feature<br>• 2 DI 120 V AC<br>• 2 DI 230 V AC<br>• 4 DI 24 ... 48 V UC<br>• 4 DI 24 V DC SOURCE INPUT<br>Ordering unit 1 unit<br>• 4 DI 24 V DC NAMUR<br>• 8 DI 24 V DC Standard<br>• 8 DI, 24 V DC, standard SOURCE INPUT                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>6ES7 131-4BB01-0AA0</b><br><b>6ES7 131-4BB01-0AB0</b><br><b>6ES7 131-4BD01-0AA0</b><br><b>6ES7 131-4BD01-0AB0</b><br><b>6ES7 131-4EB00-0AB0</b><br><b>6ES7 131-4FB00-0AB0</b><br><b>6ES7 131-4CD02-0AB0</b><br><b>6ES7 131-4BD51-0AA0</b>                                                                                                                                                                                                                                                 |                                                                                                                      |
| <b>Digital output modules</b><br>Ordering unit 5 units<br>• 2 DO 24 V DC/0.5 A Standard<br>• 2 DO 24 V DC/0.5 A High Feature<br>• 2 DO 24 V DC/2 A Standard<br>• 2 DO 24 V DC/2 A High Feature<br>• 4 DO 24 V DC/0.5 A Standard<br>• 4 DO, 24 V DC / 0.5 A Standard SOURCE OUTPUT<br>• 4 DO 24 V DC/0.5 A High Feature<br>• 8 DO 24 V DC/0.5 A High Feature<br>• 4 DO 24 V DC/2 A Standard<br>• 4 DO 24 V DC/2 A High Feature<br>• 2 DO 24 to 230 V AC/2 A<br>• 2 DO 24 V DC to 230 V AC/5 A relay, NO contact<br>• 2 DO 24...48 V DC/5 A, 24...230 V AC/5 A relay, changeover contact<br>Ordering unit 1 unit<br>• 2 DO 24...48 V DC/5 A, 24...230 V AC/5 A relay, changeover contact, with manual operation<br>• 8 DO 24 V DC/0.5 A Standard<br>• 8 DO, 24 V DC / 0.5 A Standard SOURCE OUTPUT |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>6ES7 132-4BB01-0AA0</b><br><b>6ES7 132-4BB01-0AB0</b><br><b>6ES7 132-4BB31-0AA0</b><br><b>6ES7 132-4BB31-0AB0</b><br><b>6ES7 132-4BD02-0AA0</b><br><b>6ES7 132-4BD50-0AA0</b><br><b>6ES7 132-4BD00-0AB0</b><br><b>6ES7 132-4BF00-0AB0</b><br><b>6ES7 132-4BD32-0AA0</b><br><b>6ES7 132-4BD30-0AB0</b><br><b>6ES7 132-4FB01-0AB0</b><br><b>6ES7 132-4HB01-0AB0</b><br><b>6ES7 132-4HB12-0AB0</b><br><b>6ES7 132-4HB50-0AB0</b><br><b>6ES7 132-4BF00-0AA0</b><br><b>6ES7 132-4BF50-0AA0</b> |                                                                                                                      |
| <b>Accessories</b><br><b>Label sheets DIN A4 (10 units)</b><br>Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules<br>• petrol<br>• red<br>• yellow<br>• light beige                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>6ES7 193-4BH00-0AA0</b><br><b>6ES7 193-4BD00-0AA0</b><br><b>6ES7 193-4BB00-0AA0</b><br><b>6ES7 193-4BA00-0AA0</b> |

I: Subject to export regulations AL: N and ECCN: EAR99H

## SIMATIC ET 200 distributed I/O

## ET 200S

## I/O modules

## Analog electronic modules

## Overview



- Analog inputs and outputs for the ET 200S
- Can be plugged onto TM-E terminal modules with automatic coding
- High-feature versions with enhanced performance, precision and resolution
- High-speed versions with extremely fast, isochronous cycle times.
- Hot swapping of modules possible during operation

Note:

Consult the configuring guide for selection of the appropriate TM-E terminal modules.

## Technical specifications

|                                                              | 6ES7 134-4FB01-0AB0                                          | 6ES7 134-4LB02-0AB0                                                                                    | 6ES7 134-4GB01-0AB0                                          | 6ES7 134-4GB52-0AB0 |
|--------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------|
| <b>Supply voltages</b>                                       |                                                              |                                                                                                        |                                                              |                     |
| Load voltage L+                                              |                                                              |                                                                                                        |                                                              |                     |
| • Rated value (DC)                                           | 24 V; from power module                                      | 24 V                                                                                                   | 24 V; from power module                                      | 24 V                |
| • Short-circuit protection                                   |                                                              |                                                                                                        |                                                              | Yes                 |
| • Reverse polarity protection                                | Yes                                                          | Yes                                                                                                    | Yes; destruction limit 35 mA per channel                     | Yes                 |
| <b>Power supply to the transmitters</b>                      |                                                              |                                                                                                        |                                                              |                     |
| • present                                                    |                                                              | No                                                                                                     |                                                              | Yes                 |
| • short-circuit proof                                        |                                                              |                                                                                                        |                                                              | Yes                 |
| <b>Current consumption</b>                                   |                                                              |                                                                                                        |                                                              |                     |
| from load voltage L+ (without load), max.                    | 30 mA                                                        | 55 mA                                                                                                  | 80 mA                                                        | 225 mA              |
| from backplane bus 3.3 V DC, max.                            | 10 mA                                                        | 10 mA                                                                                                  | 10 mA                                                        | 10 mA               |
| <b>Power losses</b>                                          |                                                              |                                                                                                        |                                                              |                     |
| Power loss, typ.                                             | 0.6 W                                                        | 0.85 W                                                                                                 | 0.6 W                                                        | 2.5 W               |
| <b>Address area</b>                                          |                                                              |                                                                                                        |                                                              |                     |
| Address space per module                                     |                                                              |                                                                                                        |                                                              |                     |
| • Address space per module, max.                             | 4 byte                                                       | 4 byte                                                                                                 | 4 byte                                                       | 4 byte              |
| <b>Isochronous mode</b>                                      |                                                              |                                                                                                        |                                                              |                     |
| Isochronous mode                                             | No                                                           | Yes                                                                                                    | No                                                           | Yes                 |
| <b>Analog inputs</b>                                         |                                                              |                                                                                                        |                                                              |                     |
| Number of analog inputs                                      | 2                                                            | 2                                                                                                      | 2                                                            | 2                   |
| Cable length, shielded, max.                                 | 200 m                                                        | 200 m                                                                                                  | 200 m                                                        | 200 m               |
| Cycle time (all channels) max.                               | Number of active channels per module x basic conversion time | 0.5 ms; 0.5 ms for 2 channels without noise suppression, 18 / 21 ms per channel with noise suppression | Number of active channels per module x basic conversion time | 0.25 ms             |
| <b>Technical unit for temperature measurement adjustable</b> |                                                              |                                                                                                        |                                                              |                     |
| • Voltage                                                    | Yes                                                          | Yes                                                                                                    | No                                                           | No                  |
| • Current                                                    | No                                                           | No                                                                                                     | Yes                                                          | Yes                 |
| • Thermocouple                                               | No                                                           | No                                                                                                     | No                                                           | No                  |
| • Resistance thermometer                                     | No                                                           | No                                                                                                     | No                                                           | No                  |
| • Resistance                                                 | No                                                           | No                                                                                                     | No                                                           | No                  |

## Technical specifications (continued)

|                                                                         | 6ES7 134-4FB01-0AB0                                                     | 6ES7 134-4LB02-0AB0                                                | 6ES7 134-4GB01-0AB0                               | 6ES7 134-4GB52-0AB0 |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------|---------------------|
| Input ranges (rated values), voltages                                   |                                                                         |                                                                    |                                                   |                     |
| • 1 to 5 V                                                              | Yes                                                                     | Yes                                                                |                                                   |                     |
| • Input resistance (1 to 5 V)                                           |                                                                         | 800 kΩ                                                             |                                                   |                     |
| • -10 V to +10 V                                                        | Yes                                                                     | Yes                                                                |                                                   |                     |
| • Input resistance (-10 V to +10 V)                                     |                                                                         | 800 kΩ                                                             |                                                   |                     |
| • -5 V to +5 V                                                          | Yes                                                                     | Yes                                                                |                                                   |                     |
| • Input resistance (-5 V to +5 V)                                       |                                                                         | 800 kΩ                                                             |                                                   |                     |
| Input ranges (rated values), currents                                   |                                                                         |                                                                    |                                                   |                     |
| • 0 to 20 mA                                                            |                                                                         |                                                                    |                                                   | Yes                 |
| • Input resistance (0 to 20 mA)                                         |                                                                         |                                                                    |                                                   | 106 Ω               |
| • 4 to 20 mA                                                            |                                                                         |                                                                    | Yes; on 50 Ohm                                    | Yes                 |
| Voltage input                                                           |                                                                         |                                                                    |                                                   |                     |
| • permissible input voltage for voltage input (destruction limit), max. | 35 V; 35 V permanent; 75 V for max. 1 ms (mark to space ratio 1:20)     | 35 V; 35 V permanent; 75 V for max. 1 ms                           |                                                   |                     |
| Current input                                                           |                                                                         |                                                                    |                                                   |                     |
| • permissible input current for current input (destruction limit), max. |                                                                         |                                                                    | 40 mA                                             |                     |
| <b>Analog value creation</b>                                            |                                                                         |                                                                    |                                                   |                     |
| Measurement principle                                                   | integrating                                                             |                                                                    | integrating                                       |                     |
| Integration and conversion time/ resolution per channel                 |                                                                         |                                                                    |                                                   |                     |
| • Resolution with overrange (bit including sign), max.                  | 14 bit; +/-10 V: 13 bit + sign, +/-5 V: 13 bit + sign; 1 to 5 V: 13 bit | 16 bit; 0 to 5 V: 15 bit, +/-10 V: 16 bit, +/-5 V: 16 bit<br>Yes   | 13 bit; 4 to 20 mA: 13 bit                        | 16 bit              |
| • Integration time, parameterizable                                     |                                                                         |                                                                    |                                                   |                     |
| • Integration time, ms                                                  | 16.7 / 20 ms                                                            |                                                                    | 16.7 / 20 ms                                      |                     |
| • Interference voltage suppression for interference frequency f1 in Hz  | 60 / 50 Hz                                                              | 60 / 50 Hz / no                                                    | 60 / 50 Hz                                        |                     |
| • Conversion time (per channel)                                         | 65 ms; 55 / 65 ms                                                       | 0.04 ms; without noise suppression 17/20 ms per channel with error | 65 ms; 55 / 65 ms                                 |                     |
| Smoothering of measured values                                          |                                                                         |                                                                    |                                                   |                     |
| • parameterizable                                                       | Yes; in four stages by means of digital filtering                       | Yes; in 4 stages: 1 x, 4 x, 16 x, 32 x cycle time                  | Yes; in four stages by means of digital filtering | Yes                 |
| • Step: None                                                            | Yes; 1 x cycle time                                                     | Yes; 1 x                                                           | Yes; 1 x cycle time                               | Yes; 1              |
| • Step: Low                                                             | Yes; 4 x cycle time                                                     | Yes; 4 x                                                           | Yes; 4 x cycle time                               | Yes; 4              |
| • Step: Medium                                                          | Yes; 32 x cycle time                                                    | Yes; 16 x                                                          | Yes; 32 x cycle time                              | Yes; 16             |
| • Step: High                                                            | Yes; 64 x cycle time                                                    | Yes; 32 x                                                          | Yes; 64 x cycle time                              | Yes; 32             |
| <b>Encoder</b>                                                          |                                                                         |                                                                    |                                                   |                     |
| Connection of signal encoders                                           |                                                                         |                                                                    |                                                   |                     |
| • for voltage measurement                                               |                                                                         | Yes                                                                |                                                   |                     |
| • for current measurement as 2-wire transducer                          |                                                                         |                                                                    |                                                   | Yes                 |
| • Burden of 2-wire transmitter, max.                                    |                                                                         |                                                                    | 750 Ω                                             |                     |

## SIMATIC ET 200 distributed I/O

## ET 200S

## I/O modules

## Analog electronic modules

## Technical specifications (continued)

|                                                                                                         | 6ES7 134-4FB01-0AB0                                 | 6ES7 134-4LB02-0AB0                                         | 6ES7 134-4GB01-0AB0      | 6ES7 134-4GB52-0AB0    |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|--------------------------|------------------------|
| <b>Errors/accuracies</b>                                                                                |                                                     |                                                             |                          |                        |
| Linearity error (relative to input area)                                                                | +/- 0.01 %                                          | +/- 0.01 %                                                  | +/- 0.01 %               | +/- 0.03 %             |
| Temperature error (relative to input area)                                                              | +/- 0.01 %/K                                        | +/- 0.003 %/K                                               | +/- 0.005 %/K            | +/- 0.01 %/K           |
| Crosstalk between the inputs, min.                                                                      | -50 dB                                              | -100 dB                                                     | -50 dB                   | 50 dB                  |
| Repeat accuracy in settled status at 25 °C (relative to input area)                                     | +/- 0.05 %                                          | +/- 0.01 %                                                  | +/- 0.05 %               | +/- 0.1 %              |
| Operational limit in overall temperature range                                                          |                                                     |                                                             |                          |                        |
| • Voltage, relative to input area                                                                       | +/- 0.6 %                                           | +/- 0.1 %; 0.2% without interference frequency suppression  |                          |                        |
| • Current, relative to input area                                                                       |                                                     |                                                             | +/- 0.6 %                | +/- 0.3 %              |
| Basic error limit (operational limit at 25 °C)                                                          |                                                     |                                                             |                          |                        |
| • Voltage, relative to input area                                                                       | +/- 0.4 %                                           | +/- 0.05 %; 0.1% without interference frequency suppression |                          |                        |
| • Current, relative to input area                                                                       |                                                     |                                                             | +/- 0.4 %                | +/- 0.2 %              |
| Interference voltage suppression for $f = n \times f_l$ ( $f_l$ +/- 1%), $f_l$ = interference frequency |                                                     |                                                             |                          |                        |
| • Series mode interference (peak value of interference < rated value of input range), min.              | 70 dB                                               | 90 dB                                                       | 70 dB                    |                        |
| • Common mode voltage ( $U_{SS} < 2.5 \text{ V}$ ), min.                                                | 90 dB                                               | 100 dB                                                      |                          |                        |
| <b>Parameter</b>                                                                                        |                                                     |                                                             |                          |                        |
| Remark                                                                                                  | 4 byte                                              | 12 byte, 4 byte in compatibility mode                       | 4 byte                   |                        |
| Diagnostics: wire break                                                                                 | Disable / enable (only in measuring range 1 to 5 V) |                                                             |                          | At 4 to 20 mA          |
| Measurement type/range                                                                                  | deactivated / +/-5 V / 1 to 5 V / +/-10 V           | deactivated / +/-5 V / 1 to 5 V / +/-10 V                   | deactivated / 4 to 20 mA | 4 to 20 mA, 0 to 20 mA |
| Interference frequency suppression                                                                      |                                                     |                                                             |                          | No                     |
| Group diagnostics                                                                                       | Disable/enable                                      | Disable/enable                                              | Disable/enable           | 1                      |
| Overflow/underflow                                                                                      | Disable/enable                                      | Disable/enable                                              | Disable/enable           | 1                      |
| <b>Alarms/diagnostics/status information</b>                                                            |                                                     |                                                             |                          |                        |
| <b>Alarms</b>                                                                                           |                                                     |                                                             |                          |                        |
| • Process alarm                                                                                         |                                                     | Yes                                                         |                          | Yes                    |
| <b>Diagnostics</b>                                                                                      |                                                     |                                                             |                          |                        |
| • Diagnostic functions                                                                                  |                                                     | Yes                                                         |                          | Yes                    |
| • Wire break                                                                                            | Yes; measuring range 1 to 5 V only                  | Yes; measuring range 1 to 5 V only                          | Yes                      | Yes; at 4 to 20 mA     |
| • Group error                                                                                           | Yes                                                 | Yes                                                         | Yes                      | Yes                    |
| • Overflow/underflow                                                                                    | Yes                                                 | Yes                                                         | Yes                      | Yes                    |
| <b>Diagnostic indication LED</b>                                                                        |                                                     |                                                             |                          |                        |
| • Group error SF (red)                                                                                  | Yes                                                 | Yes                                                         | Yes                      | Yes                    |

## Technical specifications (continued)

|                                                | 6ES7 134-4FB01-0AB0 | 6ES7 134-4LB02-0AB0                                                         | 6ES7 134-4GB01-0AB0 | 6ES7 134-4GB52-0AB0 |
|------------------------------------------------|---------------------|-----------------------------------------------------------------------------|---------------------|---------------------|
| <b>Isolation</b>                               |                     |                                                                             |                     |                     |
| Isolation checked with                         | 500 V DC            | 500 V DC                                                                    | 500 V DC            |                     |
| <b>Galvanic isolation</b>                      |                     |                                                                             |                     |                     |
| Galvanic isolation analog inputs               |                     |                                                                             |                     |                     |
| • between the channels                         | No                  | No; however, increased permissible potential difference between the inputs. | No                  | No                  |
| • between the channels and the backplane bus   | Yes                 | Yes                                                                         | Yes                 | Yes                 |
| • between the channels and the load voltage L+ | Yes                 | Yes                                                                         | No                  | Yes                 |
| <b>Permissible potential difference</b>        |                     |                                                                             |                     |                     |
| between the inputs (UCM)                       |                     | 140 V DC/100 V AC                                                           |                     |                     |
| between inputs and MANA (UCM)                  | 2 V AC PP           |                                                                             |                     |                     |
| between MANA and M internally (UISO)           | 75 V DC / 60 V AC   |                                                                             |                     | 75 V DC, 60 V AC    |
| <b>Dimensions</b>                              |                     |                                                                             |                     |                     |
| Module width, max.                             |                     | 15 mm                                                                       |                     | 15 mm               |
| <b>Dimensions and weight</b>                   |                     |                                                                             |                     |                     |
| Dimensions                                     |                     |                                                                             |                     |                     |
| • Width                                        | 15 mm               | 15 mm                                                                       | 15 mm               | 15 mm               |
| • Height                                       | 81 mm               | 81 mm                                                                       | 81 mm               | 81 mm               |
| • Depth                                        | 52 mm               | 52 mm                                                                       | 52 mm               | 52 mm               |
| Weight                                         |                     |                                                                             |                     |                     |
| • Weight, approx.                              | 40 g                | 45 g                                                                        | 40 g                |                     |

|                                           | 6ES7 134-4GB11-0AB0     | 6ES7 134-4MB02-0AB0 | 6ES7 134-4GD00-0AB0            | 6ES7 134-4FB52-0AB0 | 6ES7 134-4GB62-0AB0 |
|-------------------------------------------|-------------------------|---------------------|--------------------------------|---------------------|---------------------|
| <b>Supply voltages</b>                    |                         |                     |                                |                     |                     |
| Load voltage L+                           |                         |                     |                                |                     |                     |
| • Rated value (DC)                        | 24 V; from power module | 24 V                | 24 V; from power module        | 24 V                | 24 V                |
| • Short-circuit protection                |                         |                     |                                |                     | Yes                 |
| • Reverse polarity protection             |                         | Yes                 | Yes                            | Yes                 | Yes                 |
| Power supply to the transmitters          |                         |                     |                                |                     |                     |
| • present                                 |                         | Yes                 | Yes                            |                     | Yes                 |
| • short-circuit proof                     |                         | Yes                 | Yes; approx. 200 mA for module |                     | Yes                 |
| <b>Current consumption</b>                |                         |                     |                                |                     |                     |
| from load voltage L+ (without load), max. | 30 mA                   | 48 mA               | 125 mA                         | 80 mA               | 80 mA; without load |
| from backplane bus 3.3 V DC, max.         | 10 mA                   | 10 mA               | 10 mA                          | 10 mA               | 10 mA               |
| <b>Power losses</b>                       |                         |                     |                                |                     |                     |
| Power loss, typ.                          | 0.6 W                   | 1.2 W               | 0.6 W                          | 1.9 W               | 1.9 W               |
| <b>Address area</b>                       |                         |                     |                                |                     |                     |
| Address space per module                  |                         |                     |                                |                     |                     |
| • Address space per module, max.          | 4 byte                  | 4 byte              | 8 byte                         | 4 byte              | 4 byte              |
| <b>Isochronous mode</b>                   |                         |                     |                                |                     |                     |
| Isochronous mode                          | No                      | Yes                 | No                             | Yes                 | Yes                 |

## SIMATIC ET 200 distributed I/O

## ET 200S

## I/O modules

## Analog electronic modules

## Technical specifications (continued)

|                                                                         | 6ES7 134-4GB11-0AB0                                          | 6ES7 134-4MB02-0AB0                                                                                    | 6ES7 134-4GD00-0AB0           | 6ES7 134-4FB52-0AB0                                               | 6ES7 134-4GB62-0AB0 |
|-------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------|---------------------|
| <b>Analog inputs</b>                                                    |                                                              |                                                                                                        |                               |                                                                   |                     |
| Number of analog inputs                                                 | 2                                                            | 2                                                                                                      | 4                             | 2                                                                 | 2                   |
| Cable length, shielded, max.                                            | 200 m                                                        | 200 m                                                                                                  | 200 m                         | 200 m                                                             | 200 m               |
| Cycle time (all channels) max.                                          | Number of active channels per module x basic conversion time | 0.5 ms; 0.5 ms for 2 channels without noise suppression, 18 / 21 ms per channel with noise suppression | 40 ms; 33 to 40 ms            | 250 µs                                                            | 250 µs              |
| Technical unit for temperature measurement adjustable                   |                                                              |                                                                                                        |                               |                                                                   |                     |
| • Voltage                                                               | No                                                           | No                                                                                                     | No                            | Yes                                                               | No                  |
| • Current                                                               | Yes                                                          | Yes                                                                                                    | Yes                           | No                                                                | Yes                 |
| • Thermocouple                                                          | No                                                           | No                                                                                                     | No                            | No                                                                | No                  |
| • Resistance thermometer                                                | No                                                           | No                                                                                                     | No                            | No                                                                | No                  |
| • Resistance                                                            | No                                                           | No                                                                                                     | No                            | No                                                                | No                  |
| Input ranges (rated values), voltages                                   |                                                              |                                                                                                        |                               |                                                                   |                     |
| • 1 to 5 V                                                              |                                                              |                                                                                                        |                               | Yes                                                               |                     |
| • Input resistance (1 to 5 V)                                           |                                                              |                                                                                                        |                               | 120 kΩ                                                            |                     |
| • -10 V to +10 V                                                        |                                                              |                                                                                                        |                               | Yes                                                               |                     |
| • Input resistance (-10 V to +10 V)                                     |                                                              |                                                                                                        |                               | 120 kΩ                                                            |                     |
| • -2.5 V to +2.5 V                                                      |                                                              |                                                                                                        |                               | Yes                                                               |                     |
| • Input resistance (-2.5 V to +2.5 V)                                   |                                                              |                                                                                                        |                               | 120 kΩ                                                            |                     |
| • -5 V to +5 V                                                          |                                                              |                                                                                                        |                               | Yes                                                               |                     |
| • Input resistance (-5 V to +5 V)                                       |                                                              |                                                                                                        |                               | 120 kΩ                                                            |                     |
| Input ranges (rated values), currents                                   |                                                              |                                                                                                        |                               |                                                                   |                     |
| • 0 to 20 mA                                                            |                                                              |                                                                                                        |                               |                                                                   | Yes                 |
| • Input resistance (0 to 20 mA)                                         |                                                              |                                                                                                        |                               |                                                                   | 106 Ω               |
| • -20 to +20 mA                                                         | Yes; 50 Ohm                                                  | Yes                                                                                                    |                               |                                                                   | Yes                 |
| • 4 to 20 mA                                                            | Yes; 50 Ohm                                                  | Yes                                                                                                    | Yes; on 25 Ohm                |                                                                   | Yes                 |
| Voltage input                                                           |                                                              |                                                                                                        |                               |                                                                   |                     |
| • permissible input voltage for voltage input (destruction limit), max. |                                                              |                                                                                                        |                               | 35 V; permanent                                                   |                     |
| Current input                                                           |                                                              |                                                                                                        |                               |                                                                   |                     |
| • permissible input current for current input (destruction limit), max. | 40 mA                                                        | 50 mA                                                                                                  | 30 mA; limited electronically |                                                                   | 30 mA               |
| <b>Analog value creation</b>                                            |                                                              |                                                                                                        |                               |                                                                   |                     |
| Measurement principle                                                   | integrating                                                  | Sigma Delta                                                                                            | integrating                   |                                                                   |                     |
| Integrations and conversion time/ resolution per channel                |                                                              |                                                                                                        |                               |                                                                   |                     |
| • Resolution with overrange (bit including sign), max.                  | 14 bit; +/-20 mA:<br>14 bit, 4 to 20 mA:<br>13 bit           | 16 bit; as required                                                                                    | 13 bit; 4 to 20 mA:<br>13 bit | 16 bit; 15 bit: 1 to 5 V;<br>+/-2.5 V; 16 bit:<br>+/-10 V; +/-5 V | 16 bit              |

## Technical specifications (continued)

|                                                                        | 6ES7 134-4GB11-0AB0                               | 6ES7 134-4MB02-0AB0                                                | 6ES7 134-4GD00-0AB0  | 6ES7 134-4FB52-0AB0  | 6ES7 134-4GB62-0AB0  |
|------------------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------------------|----------------------|----------------------|----------------------|
| Integrations and conversion time/ resolution per channel               |                                                   |                                                                    |                      |                      |                      |
| • Integration time, parameterizable                                    |                                                   | Yes                                                                | Yes                  |                      |                      |
| • Integration time, ms                                                 | 16.7 / 20 ms                                      |                                                                    | 16.67/20 ms          |                      |                      |
| • Interference voltage suppression for interference frequency f1 in Hz | 60 / 50 Hz                                        | 60 / 50 Hz / no                                                    | 60 / 50 Hz           |                      |                      |
| • Conversion time (per channel)                                        | 65 ms; 55 / 65 ms                                 | 0.04 ms; without noise suppression 17/20 ms per channel with error |                      |                      |                      |
| Smoothering of measured values                                         |                                                   |                                                                    |                      |                      |                      |
| • parameterizable                                                      | Yes; in four stages by means of digital filtering | Yes; in 4 stages: 1 x, 4 x, 16 x, 32 x cycle time                  | Yes; in 4 stages     | Yes                  | Yes                  |
| • Step: None                                                           | Yes; 1 x cycle time                               | Yes; 1 x                                                           | Yes; 1 x cycle time  | Yes; 1 x cycle time  | Yes; 1 x cycle time  |
| • Step: Low                                                            | Yes; 4 x cycle time                               | Yes; 4 x                                                           | Yes; 4 x cycle time  | Yes; 4 x cycle time  | Yes; 4 x cycle time  |
| • Step: Medium                                                         | Yes; 32 x cycle time                              | Yes; 16 x                                                          | Yes; 16 x cycle time | Yes; 16 x cycle time | Yes; 16 x cycle time |
| • Step: High                                                           | Yes; 64 x cycle time                              | Yes; 32 x                                                          | Yes; 32 x cycle time | Yes; 32 x cycle time | Yes; 32 x cycle time |
| <b>Encoder supply</b>                                                  |                                                   |                                                                    |                      |                      |                      |
| Number of outputs                                                      |                                                   |                                                                    |                      |                      | 2                    |
| Output voltage                                                         |                                                   |                                                                    |                      |                      | 24 V                 |
| Output current, rated value                                            |                                                   |                                                                    |                      |                      | 90 mA; per channel   |
| Output current, permissible range                                      |                                                   |                                                                    |                      |                      | 0 to 90 mA           |
| Short-circuit protection                                               |                                                   |                                                                    |                      |                      | Yes                  |
| <b>Encoder</b>                                                         |                                                   |                                                                    |                      |                      |                      |
| Connection of signal encoders                                          |                                                   |                                                                    |                      | Yes                  | No                   |
| • for voltage measurement                                              |                                                   |                                                                    |                      |                      |                      |
| • for current measurement as 2-wire transducer                         |                                                   |                                                                    |                      |                      |                      |
| • burden of 2-wire transmitter, max.                                   | 750 Ω                                             | 750 Ω                                                              | 750 Ω                |                      |                      |
| <b>Errors/accuracies</b>                                               |                                                   |                                                                    |                      |                      |                      |
| Linearity error (relative to input area)                               | +/- 0.01 %                                        | +/- 0.03 %                                                         | +/- 0.01 %           | +/- 0.03 %           | +/- 0.03 %           |
| Temperature error (relative to input area)                             | +/- 0.005 %/K                                     | +/- 0.03 %/K                                                       | +/- 0.003 %/K        | +/- 0.01 %/K         | +/- 0.01 %/K         |
| Crosstalk between the inputs, min.                                     | -50 dB                                            | -100 dB                                                            | -50 dB               | -50 dB               | -50 dB               |
| Repeat accuracy in settled status at 25 °C (relative to input area)    | +/- 0.05 %                                        | +/- 0.01 %                                                         | +/- 0.05 %           | +/- 0.1 %            | +/- 0.1 %            |
| Operational limit in overall temperature range                         |                                                   |                                                                    |                      |                      |                      |
| • Voltage, relative to input area                                      |                                                   |                                                                    |                      | +/- 0.3 %            |                      |
| • Current, relative to input area                                      | +/- 0.6 %                                         | +/- 0.1 %; 0.2% without interference frequency suppression         | +/- 0.4 %            |                      | +/- 0.3 %            |



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## I/O modules

## Analog electronic modules

## Technical specifications (continued)

|                                                                                                  | 6ES7 134-4GB11-0AB0                                   | 6ES7 134-4MB02-0AB0                                                         | 6ES7 134-4GD00-0AB0                | 6ES7 134-4FB52-0AB0                                  | 6ES7 134-4GB62-0AB0                       |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------|------------------------------------------------------|-------------------------------------------|
| Basic error limit (operational limit at 25 °C)                                                   |                                                       |                                                                             |                                    |                                                      |                                           |
| • Voltage, relative to input area                                                                |                                                       |                                                                             |                                    | +/- 0.2 %                                            |                                           |
| • Current, relative to input area                                                                | +/- 0.4 %                                             | +/- 0.05 %; 0.1% without interference frequency suppression                 | +/- 0.3 %                          |                                                      | +/- 0.2 %                                 |
| Interference voltage suppression for $f = n \times f_l$ (+/- 1%), $f_l$ = interference frequency |                                                       |                                                                             |                                    |                                                      |                                           |
| • Series mode interference (peak value of interference < rated value of input range), min.       | 70 dB                                                 | 90 dB                                                                       | 70 dB                              |                                                      |                                           |
| • common mode voltage (USS < 2.5 V), min.                                                        |                                                       | 100 dB                                                                      |                                    |                                                      |                                           |
| <b>Parameter</b>                                                                                 |                                                       |                                                                             |                                    |                                                      |                                           |
| Remark                                                                                           | 4 byte                                                | 12 byte, 4 byte in compatibility mode                                       | 7 byte                             | 12 byte, 4 byte in compatibility mode                |                                           |
| Diagnostics: wire break                                                                          | Disable / enable (only in measuring range 4 to 20 mA) | Disable / enable                                                            | 1                                  |                                                      | At 4 to 20 mA                             |
| Measurement type/range                                                                           | deactivated / +/- 20 mA / 4 to 20 mA                  | deactivated / +/- 20 mA / 4 to 20 mA                                        | 1                                  | Deactivated / +/-5 V / 1 to 5 V / +/-10 V / +/-2.5 V | 4 to 20 mA, 0 to 20 mA, +/-20 mA          |
| Group diagnostics                                                                                | Disable / enable                                      | Disable / enable                                                            | 1                                  | Disable / enable                                     | Yes                                       |
| Overflow/underflow                                                                               | Disable / enable                                      | Disable / enable                                                            | 1                                  | Disable / enable                                     | Yes                                       |
| <b>Alarms/diagnostics/status information</b>                                                     |                                                       |                                                                             |                                    |                                                      |                                           |
| Alarms                                                                                           |                                                       |                                                                             |                                    |                                                      |                                           |
| • Process alarm                                                                                  |                                                       | Yes                                                                         |                                    | Yes                                                  | Yes                                       |
| Diagnostics                                                                                      |                                                       |                                                                             |                                    |                                                      |                                           |
| • Diagnostic functions                                                                           |                                                       | Yes                                                                         | Yes; can be read out               | Yes                                                  | Yes                                       |
| • Diagnostic information readable                                                                |                                                       |                                                                             |                                    | Yes                                                  | Yes                                       |
| • Wire break                                                                                     | Yes; measuring range 4 to 20 mA only                  | Yes; measuring range 4 to 20 mA only                                        | Yes; measuring range 1 to 5 V only | Yes; at 1 to 5 V                                     | Yes; only with measuring range 4 to 20 mA |
| • Group error                                                                                    | Yes                                                   | Yes                                                                         | Yes                                | Yes                                                  | Yes                                       |
| • Overflow/underflow                                                                             | Yes                                                   | Yes                                                                         | Yes                                | Yes                                                  | Yes                                       |
| Diagnostic indication LED                                                                        |                                                       |                                                                             |                                    |                                                      |                                           |
| • Group error SF (red)                                                                           | Yes                                                   | Yes                                                                         | Yes                                | Yes                                                  | Yes                                       |
| <b>Isolation</b>                                                                                 |                                                       |                                                                             |                                    |                                                      |                                           |
| Isolation checked with                                                                           | 500 V DC                                              |                                                                             | 500 V DC                           | 500 V DC                                             |                                           |
| <b>Galvanic isolation</b>                                                                        |                                                       |                                                                             |                                    |                                                      |                                           |
| Galvanic isolation analog inputs                                                                 |                                                       |                                                                             |                                    |                                                      |                                           |
| • between the channels                                                                           | No                                                    | No; however, increased permissible potential difference between the inputs. | No                                 | No                                                   | No                                        |
| • between the channels and the backplane bus                                                     | Yes                                                   | Yes                                                                         | Yes                                | Yes                                                  | Yes                                       |
| • between the channels and the load voltage L+                                                   | No                                                    | Yes                                                                         | No                                 | Yes                                                  | Yes                                       |

## Technical specifications (continued)

|                                                                                                                                                      | 6ES7 134-4GB11-0AB0                                          | 6ES7 134-4MB02-0AB0                                          | 6ES7 134-4GD00-0AB0                                          | 6ES7 134-4FB52-0AB0                                          | 6ES7 134-4GB62-0AB0                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|
| <b>Permissible potential difference</b><br>between MANA and M internally (UISO)                                                                      |                                                              |                                                              |                                                              |                                                              | 75 V DC, 60 V AC                                             |
| <b>Dimensions</b><br>Module width, max.                                                                                                              |                                                              | 15 mm                                                        |                                                              | 15 mm                                                        | 15 mm                                                        |
| <b>Dimensions and weight</b><br>Dimensions                                                                                                           |                                                              |                                                              |                                                              |                                                              |                                                              |
| • Width                                                                                                                                              | 15 mm                                                        | 15 mm                                                        | 15 mm                                                        | 15 mm                                                        | 15 mm                                                        |
| • Height                                                                                                                                             | 81 mm                                                        | 81 mm                                                        | 81 mm                                                        | 81 mm                                                        | 81 mm                                                        |
| • Depth                                                                                                                                              | 52 mm                                                        | 52 mm                                                        | 52 mm                                                        | 52 mm                                                        | 52 mm                                                        |
| <b>Weight</b><br>• Weight, approx.                                                                                                                   | 40 g                                                         | 45 g                                                         | 40 g                                                         | 45 g                                                         | 45 g                                                         |
|                                                                                                                                                      | 6ES7 134-4JB01-0AB0                                          | 6ES7 134-4JB51-0AB0                                          | 6ES7 134-4JD00-0AB0                                          | 6ES7 134-4NB01-0AB0                                          | 6ES7 134-4NB51-0AB0                                          |
| <b>Supply voltages</b><br>Load voltage L+<br>• Rated value (DC)                                                                                      | 24 V; from power module<br>Yes                               | 24 V; from power module<br>Yes                               | 24 V; from power module<br>Yes                               | 24 V; from power module<br>Yes                               | 24 V; from power module<br>Yes                               |
| • Reverse polarity protection                                                                                                                        |                                                              |                                                              |                                                              |                                                              |                                                              |
| <b>Power supply to the transmitters</b><br>• present<br>• short-circuit proof                                                                        |                                                              | Yes<br>Yes                                                   |                                                              |                                                              |                                                              |
| <b>Current consumption</b><br>from load voltage L+ (without load), max.                                                                              | 30 mA                                                        | 30 mA                                                        | 30 mA                                                        | 30 mA                                                        | 30 mA                                                        |
| from backplane bus 3.3 V DC, max.                                                                                                                    | 10 mA                                                        | 10 mA                                                        | 10 mA                                                        | 10 mA                                                        | 10 mA                                                        |
| <b>Power losses</b><br>Power loss, typ.                                                                                                              | 0.6 W                                                        | 0.6 W                                                        | 0.6 W                                                        | 0.6 W                                                        | 0.6 W                                                        |
| <b>Address area</b><br>Address space per module<br>• Address space per module, max.                                                                  | 4 byte                                                       | 8 byte                                                       | 8 byte                                                       | 4 byte                                                       | 4 byte                                                       |
| <b>Isochronous mode</b><br>Isochronous mode                                                                                                          | No                                                           | No                                                           | No                                                           |                                                              | No                                                           |
| <b>Analog inputs</b><br>Number of analog inputs                                                                                                      | 2                                                            | 4; 2 for 3 or 4-wire connection                              | 4                                                            | 2                                                            | 2                                                            |
| Cable length, shielded, max.                                                                                                                         | 50 m                                                         | 200 m                                                        | 50 m                                                         | 50 m                                                         | 200 m                                                        |
| Constant measurement current for resistance-type transmitter, typ.                                                                                   |                                                              | 1.67 mA                                                      |                                                              |                                                              | 1.25 mA                                                      |
| Cycle time (all channels) max.                                                                                                                       | Number of active channels per module x basic conversion time | Number of active channels per module x basic conversion time | Number of active channels per module x basic conversion time | Number of active channels per module x basic conversion time | Number of active channels per module x basic conversion time |
| <b>Technical unit for temperature measurement adjustable</b><br>• Voltage<br>• Current<br>• Thermocouple<br>• Resistance thermometer<br>• Resistance | No<br>Yes<br>Yes                                             | No<br><br>Yes<br>Yes                                         | No<br>Yes<br>Yes                                             | Yes<br>Yes<br>No<br>Yes<br>No                                | Yes<br>Yes<br>No<br>Yes<br>Yes                               |

## SIMATIC ET 200 distributed I/O

## ET 200S

## I/O modules

## Analog electronic modules

## Technical specifications (continued)

|                                                      | 6ES7 134-4JB01-0AB0 | 6ES7 134-4JB51-0AB0     | 6ES7 134-4JD00-0AB0 | 6ES7 134-4NB01-0AB0 | 6ES7 134-4NB51-0AB0 |
|------------------------------------------------------|---------------------|-------------------------|---------------------|---------------------|---------------------|
| Input ranges (rated values), voltages                |                     |                         |                     |                     |                     |
| • -80 mV to +80 mV                                   | Yes                 |                         | Yes                 | Yes                 |                     |
| • Input resistance (-80 mV to +80 mV)                | 1 MΩ                |                         | 1 MΩ                | 1 MΩ                |                     |
| Input ranges (rated values), thermoelements          |                     |                         |                     |                     |                     |
| • Type B                                             | Yes                 |                         | Yes                 | Yes                 |                     |
| • Input resistance (Type B)                          | 1 MΩ                |                         | 1 MΩ                | 1 MΩ                |                     |
| • Type C                                             |                     |                         |                     | Yes                 |                     |
| • Input resistance (Type C)                          |                     |                         |                     | 1 MΩ                |                     |
| • Type E                                             | Yes                 |                         | Yes                 | Yes                 |                     |
| • Input resistance (Type E)                          | 1 MΩ                |                         | 1 MΩ                | 1 MΩ                |                     |
| • Type J                                             | Yes                 |                         | Yes                 | Yes                 |                     |
| • Input resistance (type J)                          | 1 MΩ                |                         | 1 MΩ                | 1 MΩ                |                     |
| • Type K                                             | Yes                 |                         | Yes                 | Yes                 |                     |
| • Input resistance (Type K)                          | 1 MΩ                |                         | 1 MΩ                | 1 MΩ                |                     |
| • Type L                                             | Yes                 |                         | Yes                 | Yes                 |                     |
| • Input resistance (Type L)                          | 1 MΩ                |                         | 1 MΩ                | 1 MΩ                |                     |
| • Type N                                             | Yes                 |                         | Yes                 | Yes                 |                     |
| • Input resistance (Type N)                          | 1 MΩ                |                         | 1 MΩ                | 1 MΩ                |                     |
| • Type R                                             | Yes                 |                         | Yes                 | Yes                 |                     |
| • Input resistance (Type R)                          | 1 MΩ                |                         | 1 MΩ                | 1 MΩ                |                     |
| • Type S                                             | Yes                 |                         | Yes                 | Yes                 |                     |
| • Input resistance (Type S)                          | 1 MΩ                |                         | 1 MΩ                | 1 MΩ                |                     |
| • Type T                                             | Yes                 |                         | Yes                 | Yes                 |                     |
| • Input resistance (Type T)                          | 1 MΩ                |                         | 1 MΩ                | 1 MΩ                |                     |
| Input ranges (rated values), resistance thermometers |                     |                         |                     |                     |                     |
| • Cu 10                                              |                     |                         |                     |                     | Yes                 |
| • Input resistance (Cu 10)                           |                     |                         |                     |                     | 10 MΩ               |
| • Ni 100                                             |                     | Yes; standard/climate   |                     |                     | Yes                 |
| • Input resistance (Ni 100)                          |                     | 2 000 kΩ                |                     |                     | 10 MΩ               |
| • Ni 1000                                            |                     |                         |                     |                     | Yes                 |
| • Input resistance (Ni 1000)                         |                     |                         |                     |                     | 10 MΩ               |
| • Ni 120                                             |                     |                         |                     |                     | Yes                 |
| • Input resistance (Ni 120)                          |                     |                         |                     |                     | 10 MΩ               |
| • Ni 200                                             |                     |                         |                     |                     | Yes                 |
| • Input resistance (Ni 200)                          |                     |                         |                     |                     | 10 MΩ               |
| • Ni 500                                             |                     |                         |                     |                     | Yes                 |
| • Input resistance (Ni 500)                          |                     |                         |                     |                     | 10 MΩ               |
| • Pt 100                                             |                     | Yes; standard / climate |                     |                     | Yes                 |
| • Input resistance (Pt 100)                          |                     | 2 000 kΩ                |                     |                     | 10 MΩ               |

## Technical specifications (continued)

|                                                                         | 6ES7 134-4JB01-0AB0                                      | 6ES7 134-4JB51-0AB0                                                          | 6ES7 134-4JD00-0AB0                                      | 6ES7 134-4NB01-0AB0                            | 6ES7 134-4NB51-0AB0                                                                                                                                           |
|-------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input ranges (rated values), resistance thermometers                    |                                                          |                                                                              |                                                          |                                                |                                                                                                                                                               |
| • Pt 1000                                                               |                                                          |                                                                              |                                                          |                                                | Yes                                                                                                                                                           |
| • Input resistance (Pt 1000)                                            |                                                          |                                                                              |                                                          |                                                | 10 MΩ                                                                                                                                                         |
| • Pt 200                                                                |                                                          |                                                                              |                                                          |                                                | Yes                                                                                                                                                           |
| • Input resistance (Pt 200)                                             |                                                          |                                                                              |                                                          |                                                | 10 MΩ                                                                                                                                                         |
| • Pt 500                                                                |                                                          |                                                                              |                                                          |                                                | Yes                                                                                                                                                           |
| • Input resistance (Pt 500)                                             |                                                          |                                                                              |                                                          |                                                | 10 MΩ                                                                                                                                                         |
| Input ranges (rated values), resistors                                  |                                                          |                                                                              |                                                          |                                                |                                                                                                                                                               |
| • 0 to 150 Ohm                                                          |                                                          | Yes                                                                          |                                                          |                                                | Yes                                                                                                                                                           |
| • Input resistance (0 to 150 Ohm)                                       |                                                          | 2 000 kΩ                                                                     |                                                          |                                                | 10 MΩ                                                                                                                                                         |
| • 0 to 300 Ohm                                                          |                                                          | Yes                                                                          |                                                          |                                                | Yes                                                                                                                                                           |
| • Input resistance (0 to 300 Ohm)                                       |                                                          | 2 000 kΩ                                                                     |                                                          |                                                | 10 MΩ                                                                                                                                                         |
| • 0 to 600 Ohm                                                          |                                                          | Yes                                                                          |                                                          |                                                | Yes                                                                                                                                                           |
| • Input resistance (0 to 600 Ohm)                                       |                                                          | 2 000 kΩ                                                                     |                                                          |                                                | 10 MΩ                                                                                                                                                         |
| • 0 to 3000 Ohm                                                         |                                                          |                                                                              |                                                          |                                                | Yes                                                                                                                                                           |
| • Input resistance (0 to 3000 Ohm)                                      |                                                          |                                                                              |                                                          |                                                | 10 MΩ                                                                                                                                                         |
| Voltage input                                                           |                                                          |                                                                              |                                                          |                                                |                                                                                                                                                               |
| • permissible input voltage for voltage input (destruction limit), max. | 10 V; permanent                                          | 9 V                                                                          | 10 V; permanent                                          | 20 V; +/-20 V, permanent                       | 9 V                                                                                                                                                           |
| Characteristic linearization                                            |                                                          |                                                                              |                                                          |                                                |                                                                                                                                                               |
| • parameterizable                                                       | Yes; type B, E, J, K, L, N, R, S, T to IEC 584           | Yes; for Pt100, Ni100                                                        | Yes; type B, E, J, K, L, N, R, S, T to IEC 584           | Yes                                            | Yes; for Ptxxx, Nixxx                                                                                                                                         |
| • for thermocouples                                                     |                                                          |                                                                              |                                                          | Type B, C, E, J, K, L, N, R, S, T to IEC 584   |                                                                                                                                                               |
| • for resistance thermometer                                            |                                                          | Pt100 (standard, climatic range), Ni100 (standard, climatic range)           |                                                          |                                                | Ptxxx, Nixxx                                                                                                                                                  |
| Temperature compensation                                                |                                                          |                                                                              |                                                          |                                                |                                                                                                                                                               |
| • internal temperature compensation                                     | Not possible                                             |                                                                              | Not possible                                             | Yes; possible with TM-E15S24-AT, TM-E15C24-AT  | Yes                                                                                                                                                           |
| • external temperature compensation with compensations socket           | Yes; possible, one external compensating box per channel |                                                                              | Yes; possible, one external compensating box per channel | Yes; one external compensating box per channel |                                                                                                                                                               |
| <b>Analog value creation</b>                                            |                                                          |                                                                              |                                                          |                                                |                                                                                                                                                               |
| Measurement principle                                                   | integrating                                              | integrating                                                                  | integrating                                              | integrating                                    | integrating (Sigma-Delta)                                                                                                                                     |
| Integrations and conversion time/resolution per channel                 |                                                          |                                                                              |                                                          |                                                |                                                                                                                                                               |
| • Resolution with overrange (bit including sign), max.                  | 16 bit; 15 bit + sign                                    | 16 bit; 150 Ohm:<br>14 bit; 300, 600 Ohm:<br>15 bit; Pt100, Ni100:<br>16 bit | 16 bit; 15 bit + sign                                    | 16 bit                                         | 16 bit; for Pt100, Ni100, Ni120, Pt200, Ni200, Pt 500, Ni 500, Pt1000, Ni1000, Cu10:<br>15 bit + sign; for 150, 300, 600, 3000 Ohm:<br>15 bit; for PTC: 1 bit |

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## ET 200S

## I/O modules

## Analog electronic modules

## Technical specifications (continued)

|                                                                        | 6ES7 134-4JB01-0AB0                                        | 6ES7 134-4JB51-0AB0                                                   | 6ES7 134-4JD00-0AB0                                               | 6ES7 134-4NB01-0AB0                                                          | 6ES7 134-4NB51-0AB0                                                                                                                                                                                              |
|------------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Integrations and conversion time/<br>resolution per channel            |                                                            |                                                                       |                                                                   |                                                                              |                                                                                                                                                                                                                  |
| • Integration time, parameterizable                                    | Yes                                                        | Yes                                                                   | Yes                                                               |                                                                              |                                                                                                                                                                                                                  |
| • Integration time, ms                                                 | 16.7 / 20 ms                                               | 16.7 / 20 ms                                                          | 16.7 / 20 ms                                                      | 16.7 / 20 ms                                                                 | 16.7 / 20 ms                                                                                                                                                                                                     |
| • Interference voltage suppression for interference frequency f1 in Hz | 60 / 50 Hz                                                 | 60 / 50 Hz                                                            | 60 / 50 Hz                                                        | 60 / 50 Hz                                                                   | 60 / 50 Hz                                                                                                                                                                                                       |
| • Conversion time (per channel)                                        | 55 / 65 ms (additional 20 ms on activated wire-break test) | 66 / 80 ms; additional conversion time for diagnostic wire break test | 65 ms; 55 / 65 ms (additional 20 ms on activated wire-break test) | 66 ms; 66 / 80 ms; additional conversion time for diagnostic wire break test | Basic conversion time incl. integration time: 50 / 60 ms; additional conversion time for diagnostic wire break test: 5 / 5 ms; additional conversion time for line compensation with 3-core connection: 50/60 ms |
| Smoothing of measured values                                           |                                                            |                                                                       |                                                                   |                                                                              |                                                                                                                                                                                                                  |
| • parameterizable                                                      | Yes; in four stages by means of digital filtering          | Yes; in four stages by means of digital filtering                     | Yes; in four stages by means of digital filtering                 | Yes; in four stages by means of digital filtering                            | Yes; in four stages by means of digital filtering                                                                                                                                                                |
| • Step: None                                                           | Yes; 1 x cycle time                                        | Yes; 1 x cycle time                                                   | Yes; 1 x cycle time                                               | Yes; 1 x cycle time                                                          | Yes; 1 x cycle time                                                                                                                                                                                              |
| • Step: Low                                                            | Yes; 4 x cycle time                                        | Yes; 4 x cycle time                                                   | Yes; 4 x cycle time                                               | Yes; 4 x cycle time                                                          | Yes; 4 x cycle time                                                                                                                                                                                              |
| • Step: Medium                                                         | Yes; 32 x cycle time                                       | Yes; 32 x cycle time                                                  | Yes; 32 x cycle time                                              | Yes; 32 x cycle time                                                         | Yes; 32 x cycle time                                                                                                                                                                                             |
| • Step: High                                                           | Yes; 64 x cycle time                                       | Yes; 64 x cycle time                                                  | Yes; 64 x cycle time                                              | Yes; 64 x cycle time                                                         | Yes; 64 x cycle time                                                                                                                                                                                             |
| <b>Encoder</b>                                                         |                                                            |                                                                       |                                                                   |                                                                              |                                                                                                                                                                                                                  |
| Connection of signal encoders                                          |                                                            |                                                                       |                                                                   |                                                                              |                                                                                                                                                                                                                  |
| • for voltage measurement                                              | Yes                                                        |                                                                       | Yes                                                               |                                                                              |                                                                                                                                                                                                                  |
| • for resistance measurement with 2-conductor connection               |                                                            | Yes                                                                   |                                                                   |                                                                              | Yes                                                                                                                                                                                                              |
| • for resistance measurement with 3-conductor connection               |                                                            | Yes                                                                   |                                                                   |                                                                              | Yes; internal compensation of the line resistances                                                                                                                                                               |
| • for resistance measurement with 4-conductor connection               |                                                            | Yes                                                                   |                                                                   |                                                                              | Yes                                                                                                                                                                                                              |
| <b>Errors/accuracies</b>                                               |                                                            |                                                                       |                                                                   |                                                                              |                                                                                                                                                                                                                  |
| Linearity error (relative to input area)                               | +/- 0.01 %                                                 | +/- 0.01 %                                                            | +/- 0.01 %                                                        | +/- 0.01 %                                                                   | +/- 0.01 %                                                                                                                                                                                                       |
| Temperature error (relative to input area)                             | +/- 0.005 %/K                                              | +/- 0.005 %/K                                                         | +/- 0.005 %/K                                                     | +/- 0.005 %/K                                                                | +/- 0.0009 %/K                                                                                                                                                                                                   |
| Crosstalk between the inputs, min.                                     | -50 dB                                                     | -50 dB                                                                | -50 dB                                                            | -50 dB                                                                       | -50 dB                                                                                                                                                                                                           |
| Repeat accuracy in settled status at 25 °C (relative to input area)    | +/- 0.05 %                                                 | +/- 0.05 %                                                            | +/- 0.05 %                                                        | +/- 0.05 %                                                                   | +/- 0.05 %                                                                                                                                                                                                       |

## Technical specifications (continued)

|                                                                                                    | 6ES7 134-4JB01-0AB0                                             | 6ES7 134-4JB51-0AB0 | 6ES7 134-4JD00-0AB0                                             | 6ES7 134-4NB01-0AB0                                                                                                                                  | 6ES7 134-4NB51-0AB0                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operational limit in overall temperature range                                                     |                                                                 |                     |                                                                 |                                                                                                                                                      |                                                                                                                                                                                                                        |
| • Voltage, relative to input area                                                                  | +/- 0.6 %                                                       |                     | +/- 0.6 %                                                       | +/- 0.1 %; +/-1.5 K for thermocouples, +/-7 K for thermocouples type C, +/-2.5 K with static thermal state (ambient temperature change < 0.3 K/min)  |                                                                                                                                                                                                                        |
| • Resistance-type thermometer, relative to input area                                              |                                                                 | +/- 0.6 %           |                                                                 |                                                                                                                                                      | Resistance-type transmitter: +/-0.1%; Pt100, Pt200, Pt500, Pt1000 standard: +/-1.0 K; Pt100, Pt200, Pt500, Pt1000 climate: +/-0.25 K; Ni100, Ni120, Ni200, Ni500, Ni1000 standard and climate: +/-0.4 K; Cu10 +/-1.5 K |
| Basic error limit (operational limit at 25 °C)                                                     |                                                                 |                     |                                                                 |                                                                                                                                                      |                                                                                                                                                                                                                        |
| • Voltage, relative to input area                                                                  | +/- 0.4 %                                                       |                     | +/- 0.4 %                                                       | +/- 0.05 %; +/-1 K with thermocouples, +/-5 K with thermocouples type C, +/-1.5 K with static thermal state (ambient temperature change < 0.3 K/min) |                                                                                                                                                                                                                        |
| • Resistance-type thermometer, relative to input area                                              |                                                                 | +/- 0.4 %           |                                                                 |                                                                                                                                                      | Resistance-type transmitter: +/-0.05%; Pt100, Pt200, Pt500, Pt1000 standard: +/-0.6 K; Pt100, Pt200, Pt500, Pt1000 climate: +/-0.13 K; Ni100, Ni120, Ni200, Ni500, Ni1000 standard and climate: +/-0.2 K; Cu10 +/-1 K  |
| Interference voltage suppression for $f = n \times (f_l \pm 1\%)$ , $f_l$ = interference frequency |                                                                 |                     |                                                                 |                                                                                                                                                      |                                                                                                                                                                                                                        |
| • Series mode interference (peak value of interference < rated value of input range), min.         | 70 dB                                                           | 70 dB               | 70 dB                                                           | 70 dB                                                                                                                                                | 70 dB                                                                                                                                                                                                                  |
| • common mode voltage (USS < 2.5 V), min.                                                          | 90 dB                                                           | 90 dB               | 90 dB                                                           | 90 dB                                                                                                                                                | 90 dB                                                                                                                                                                                                                  |
| <b>Parameter</b>                                                                                   |                                                                 |                     |                                                                 |                                                                                                                                                      |                                                                                                                                                                                                                        |
| Remark                                                                                             | 4 byte                                                          |                     | 4 byte                                                          | 4 byte                                                                                                                                               | 7 byte                                                                                                                                                                                                                 |
| Diagnostics: wire break                                                                            | Disable / enable (wire break is detected only in thermocouples) | Disable / enable    | Disable / enable (wire break is detected only in thermocouples) | Disable / enable (wire break is detected only in thermocouples)                                                                                      | Disable / enable                                                                                                                                                                                                       |

## SIMATIC ET 200 distributed I/O

## ET 200S

## I/O modules

## Analog electronic modules

## Technical specifications (continued)

|                                                      | 6ES7 134-4JB01-0AB0                                                                                                                                                                                                                                        | 6ES7 134-4JB51-0AB0                                                                                    | 6ES7 134-4JD00-0AB0                                                                                                                                                                                                                                        | 6ES7 134-4NB01-0AB0                                                                                                                                                                                                                                        | 6ES7 134-4NB51-0AB0                                                                                                                                                                                             |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement type/<br>range                           | Deactivated/ +/- 80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh-PtRh)/ TC-EL Type c (Wer-Wer) TC-EL Type N (NiCrSi-NiSi)/ TC-EL Type E (NiCr-CuNi)/ TC-EL Type R (PtRh-Pt)/ TC-EL Type S (PtRh-Pt)/ TC-EL Type J (Fe-Cu-Ni)/ TC | deactivated/150 Ohm/ ; 300 Ohm/600 Ohm/ Pt100 climatic/ Pt100 standard; Ni100 climatic, 2, 3 or 4-wire | Deactivated/ +/- 80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh-PtRh)/ TC-EL Type c (Wer-Wer) TC-EL Type N (NiCrSi-NiSi)/ TC-EL Type E (NiCr-CuNi)/ TC-EL Type R (PtRh-Pt)/ TC-EL Type S (PtRh-Pt)/ TC-EL Type J (Fe-Cu-Ni)/ TC | Deactivated/ +/- 80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh-PtRh)/ TC-EL Type c (Wer-Wer) TC-EL Type N (NiCrSi-NiSi)/ TC-EL Type E (NiCr-CuNi)/ TC-EL Type R (PtRh-Pt)/ TC-EL Type S (PtRh-Pt)/ TC-EL Type J (Fe-Cu-Ni)/ TC | deactivated/ 150 Ohm/ 300 Ohm/ 600 Ohm/Pt100/ Pt200/ Pt500/ Pt1000 each standard or climate range/ Ni100/ Ni120/ Ni200/ Ni500/ Ni1000 each standard or climate range/ Cu10 each standard or climate range / PTC |
| Group diagnostics                                    | Disable / enable                                                                                                                                                                                                                                           | Disable / enable                                                                                       | Disable / enable                                                                                                                                                                                                                                           | Disable / enable                                                                                                                                                                                                                                           | Disable / enable                                                                                                                                                                                                |
| Overflow/underflow                                   | Disable/enable                                                                                                                                                                                                                                             | Disable/enable                                                                                         | Disable/enable                                                                                                                                                                                                                                             | Disable/enable                                                                                                                                                                                                                                             | Disable/enable                                                                                                                                                                                                  |
| Comparison point                                     | none / RTD                                                                                                                                                                                                                                                 |                                                                                                        | none / RTD                                                                                                                                                                                                                                                 | none / yes, internal                                                                                                                                                                                                                                       |                                                                                                                                                                                                                 |
| Comparison point<br>number                           | none / 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8                                                                                                                                                                                                                       |                                                                                                        | none / 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| Unit                                                 | Celsius                                                                                                                                                                                                                                                    |                                                                                                        | Celsius                                                                                                                                                                                                                                                    | Celsius / Fahrenheit                                                                                                                                                                                                                                       |                                                                                                                                                                                                                 |
| <b>Alarms/diagnostics/<br/>status information</b>    |                                                                                                                                                                                                                                                            |                                                                                                        |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| Diagnostics                                          |                                                                                                                                                                                                                                                            |                                                                                                        |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| • Diagnostic functions                               | Yes; can be read out                                                                                                                                                                                                                                       | Yes; can be read out                                                                                   | Yes; can be read out                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| • Diagnostic information<br>readable                 | Yes                                                                                                                                                                                                                                                        |                                                                                                        | Yes                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| • Wire break                                         | Yes; a break in the<br>wire is only detected<br>for thermocouples                                                                                                                                                                                          | Yes                                                                                                    | Yes; a break in the<br>wire is only detected<br>for thermocouples                                                                                                                                                                                          | Yes; only thermo-<br>couples                                                                                                                                                                                                                               | Yes                                                                                                                                                                                                             |
| • Group error                                        | Yes                                                                                                                                                                                                                                                        | Yes                                                                                                    | Yes                                                                                                                                                                                                                                                        | Yes                                                                                                                                                                                                                                                        | Yes                                                                                                                                                                                                             |
| • Overflow/underflow                                 | Yes                                                                                                                                                                                                                                                        | Yes                                                                                                    | Yes                                                                                                                                                                                                                                                        | Yes                                                                                                                                                                                                                                                        | Yes                                                                                                                                                                                                             |
| Diagnostic indication<br>LED                         |                                                                                                                                                                                                                                                            |                                                                                                        |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| • Group error SF (red)                               | Yes                                                                                                                                                                                                                                                        | Yes                                                                                                    | Yes                                                                                                                                                                                                                                                        | Yes                                                                                                                                                                                                                                                        | Yes                                                                                                                                                                                                             |
| <b>Isolation</b>                                     |                                                                                                                                                                                                                                                            |                                                                                                        |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| Isolation checked with                               | 500 V DC                                                                                                                                                                                                                                                   | 500 V DC                                                                                               | 500 V DC                                                                                                                                                                                                                                                   | 500 V DC                                                                                                                                                                                                                                                   | 500 V DC                                                                                                                                                                                                        |
| <b>Galvanic isolation</b>                            |                                                                                                                                                                                                                                                            |                                                                                                        |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| Galvanic isolation<br>analog inputs                  |                                                                                                                                                                                                                                                            |                                                                                                        |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| • between the channels                               | No                                                                                                                                                                                                                                                         | No                                                                                                     | No                                                                                                                                                                                                                                                         | No                                                                                                                                                                                                                                                         | No                                                                                                                                                                                                              |
| • between the channels<br>and the backplane<br>bus   | Yes                                                                                                                                                                                                                                                        | Yes                                                                                                    | Yes                                                                                                                                                                                                                                                        | Yes                                                                                                                                                                                                                                                        | Yes                                                                                                                                                                                                             |
| • between the channels<br>and the load voltage<br>L+ |                                                                                                                                                                                                                                                            |                                                                                                        |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| <b>Permissible potential<br/>difference</b>          |                                                                                                                                                                                                                                                            |                                                                                                        |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| between inputs and<br>MANA (UCM)                     | 2 V AC PP                                                                                                                                                                                                                                                  |                                                                                                        | 2 V AC PP                                                                                                                                                                                                                                                  | 140 V DC/100 V AC                                                                                                                                                                                                                                          |                                                                                                                                                                                                                 |
| between MANA and M<br>internally (UISO)              | 75 V DC / 60 V AC                                                                                                                                                                                                                                          | 75 V DC / 60 V AC                                                                                      | 75 V DC / 60 V AC                                                                                                                                                                                                                                          | 75 V DC / 60 V AC                                                                                                                                                                                                                                          | 75 V DC / 60 V AC                                                                                                                                                                                               |
| <b>Dimensions and<br/>weight</b>                     |                                                                                                                                                                                                                                                            |                                                                                                        |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| Dimensions                                           |                                                                                                                                                                                                                                                            |                                                                                                        |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| • Width                                              | 15 mm                                                                                                                                                                                                                                                      | 15 mm                                                                                                  | 15 mm                                                                                                                                                                                                                                                      | 15 mm                                                                                                                                                                                                                                                      | 15 mm                                                                                                                                                                                                           |
| • Height                                             | 81 mm                                                                                                                                                                                                                                                      | 81 mm                                                                                                  | 81 mm                                                                                                                                                                                                                                                      | 81 mm                                                                                                                                                                                                                                                      | 81 mm                                                                                                                                                                                                           |
| • Depth                                              | 52 mm                                                                                                                                                                                                                                                      | 52 mm                                                                                                  | 52 mm                                                                                                                                                                                                                                                      | 52 mm                                                                                                                                                                                                                                                      | 52 mm                                                                                                                                                                                                           |
| Weight                                               |                                                                                                                                                                                                                                                            |                                                                                                        |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
| • Weight, approx.                                    | 40 g                                                                                                                                                                                                                                                       | 40 g                                                                                                   | 40 g                                                                                                                                                                                                                                                       | 40 g                                                                                                                                                                                                                                                       | 40 g                                                                                                                                                                                                            |

## Technical specifications (continued)

|                                                                     | 6ES7 135-4FB01-0AB0                                                     | 6ES7 135-4FB52-0AB0                                                     | 6ES7 135-4LB02-0AB0              |
|---------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------|
| <b>Supply voltages</b>                                              |                                                                         |                                                                         |                                  |
| Load voltage L+                                                     | 24 V; from power module                                                 | 24 V; from power module                                                 | 24 V                             |
| • Rated value (DC)                                                  | Yes                                                                     | Yes                                                                     | Yes                              |
| • Reverse polarity protection                                       |                                                                         |                                                                         |                                  |
| <b>Current consumption</b>                                          |                                                                         |                                                                         |                                  |
| from load voltage L+ (without load), max.                           | 130 mA                                                                  | 100 mA                                                                  | 80 mA                            |
| from backplane bus 3.3 V DC, max.                                   | 10 mA                                                                   | 10 mA                                                                   | 10 mA                            |
| <b>Power losses</b>                                                 |                                                                         |                                                                         |                                  |
| Power loss, max.                                                    | 2 W                                                                     | 2 W                                                                     | 1.2 W                            |
| <b>Address area</b>                                                 |                                                                         |                                                                         |                                  |
| Address space per module                                            |                                                                         |                                                                         |                                  |
| • Address space per module, max.                                    | 4 byte                                                                  | 4 byte                                                                  | 4 byte                           |
| <b>Isochronous mode</b>                                             |                                                                         |                                                                         |                                  |
| Isochronous mode                                                    |                                                                         | Yes                                                                     | Yes                              |
| <b>Analog outputs</b>                                               |                                                                         |                                                                         |                                  |
| Number of analog outputs                                            | 2                                                                       | 2                                                                       | 2                                |
| Cable length, shielded, max.                                        | 200 m                                                                   | 200 m; max. 20m for TWA 100µs                                           | 200 m; 100m if Twa < 2ms         |
| Voltage output, short-circuit protection                            | Yes                                                                     | Yes                                                                     | Yes                              |
| Voltage output, short-circuit current, max.                         | 25 mA                                                                   | 25 mA                                                                   | 25 mA                            |
| Cycle time (all channels) max.                                      | 1.5 ms                                                                  | 0.25 ms                                                                 | 0.5 ms; at max. 0.5 µF           |
| Output ranges, voltage                                              |                                                                         |                                                                         |                                  |
| • 1 to 5 V                                                          | Yes                                                                     | Yes                                                                     | Yes; -5 to +5 V also implemented |
| • -10 to +10 V                                                      | Yes                                                                     | Yes; +/-5V as well                                                      | Yes                              |
| Connection of actuators                                             |                                                                         |                                                                         |                                  |
| • for voltage output 2-conductor connection                         | Yes; without compensation of the line resistances                       | Yes; without compensation of the line resistances                       | Yes                              |
| • for voltage output 4-conductor connection                         | Yes                                                                     | Yes                                                                     | Yes                              |
| Load impedance (in rated range of output)                           |                                                                         |                                                                         |                                  |
| • with voltage outputs, min.                                        | 1 kΩ                                                                    | 1 kΩ                                                                    | 1 kΩ                             |
| • with voltage outputs, capacitive load, max.                       | 1 µF                                                                    | 1 µF; 0.1µF for Twa=0.1ms                                               | 0.5 µF                           |
| Destruction limits against externally applied voltages and currents |                                                                         |                                                                         |                                  |
| • Voltages at the outputs towards MANA                              | 15 V; max. 15 V permanent; 75 V for max. 1 s (mark to space ratio 1:20) | 15 V; max. 15 V for max. 5 hours, 75 V for max. 1 s                     | 15 V; as required                |
| • Current, max.                                                     | 50 mA; DC                                                               | 30 mA; DC                                                               |                                  |
| <b>Analog value creation</b>                                        |                                                                         |                                                                         |                                  |
| Integrations and conversion time/ resolution per channel            |                                                                         |                                                                         |                                  |
| • Resolution with overrange (bit including sign), max.              | 14 bit; 1 to 5 V: 12 bit, +/-10 V: 13 bit + sign                        | 16 bit; 1 to 5 V: 14 bit, +/-10 V: 15 bit + sign, +/-5 V: 14 bit + sign | 16 bit; 15 bit + sign            |
| Settling time                                                       |                                                                         |                                                                         |                                  |
| • for resistive load                                                | 0.1 ms                                                                  | 0.05 ms                                                                 | 0.2 ms                           |
| • for capacitive load                                               | 0.5 ms                                                                  | 0.05 ms                                                                 | 0.5 ms; at max. 0.5µF            |
| • for inductive load                                                | 0.5 ms                                                                  | 0.05 ms                                                                 | 0.5 ms                           |
| <b>Errors/accuracies</b>                                            |                                                                         |                                                                         |                                  |
| Output ripple (based on output area, bandwidth 0 to 50 kHz)         | +/- 0.02 %                                                              | +/- 0.02 %                                                              | +/- 0.02 %                       |



## SIMATIC ET 200 distributed I/O

## ET 200S

## I/O modules

## Analog electronic modules

## Technical specifications (continued)

|                                                                      | 6ES7 135-4FB01-0AB0                                                 | 6ES7 135-4FB52-0AB0                                                 | 6ES7 135-4LB02-0AB0                                                 |
|----------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
| Linearity error (relative to output area)                            | +/- 0.02 %                                                          | +/- 0.03 %                                                          | +/- 0.01 %                                                          |
| Temperature error (relative to output area)                          | +/- 0.01 %/K                                                        | +/- 0.01 %/K                                                        |                                                                     |
| Crosstalk between the outputs, min.                                  |                                                                     | 60 dB                                                               | 60 dB                                                               |
| Repeat accuracy in settled status at 25 °C (relative to output area) | +/- 0.05 %                                                          | +/- 0.03 %                                                          | +/- 0.01 %                                                          |
| Operational limit in overall temperature range                       |                                                                     |                                                                     |                                                                     |
| • Voltage, relative to output area                                   | +/- 0.4 %                                                           | +/- 0.2 %                                                           | +/- 0.1 %                                                           |
| Basic error limit (operational limit at 25 °C)                       |                                                                     |                                                                     |                                                                     |
| • Voltage, relative to output area                                   | +/- 0.2 %                                                           | +/- 0.01 %                                                          | +/- 0.05 %                                                          |
| <b>Parameter</b>                                                     |                                                                     |                                                                     |                                                                     |
| Remark                                                               | 7 byte                                                              | 7                                                                   | 7 byte                                                              |
| Output type/range                                                    | deactivated / 1 to 5 V / +/- 10 V                                   | deactivated / 1 to 5 V / +/- 10 V / +/- 5 V                         | deactivated / 1 to 5 V / +/- 10 V / +/- 5 V                         |
| Diagnostics: short circuit                                           | Disable / enable                                                    | Disable / enable                                                    | Disable / enable                                                    |
| Interference frequency suppression                                   |                                                                     |                                                                     | no                                                                  |
| Group diagnostics                                                    | Disable / enable                                                    | Disable / enable                                                    | Disable / enable                                                    |
| Behavior on CPU/Master STOP                                          | Output current and de-energized/ substitute a value/keep last value | Output current and de-energized/ substitute a value/keep last value | Output current and de-energized/ substitute a value/keep last value |
| <b>Alarms/diagnostics/status information</b>                         |                                                                     |                                                                     |                                                                     |
| Substitute values connectable                                        | Yes; 0 to 65535 (range of values must be within the rated range)    | Yes; 0 to 65535 (range of values must be within the rated range)    | Yes                                                                 |
| Diagnostics                                                          |                                                                     |                                                                     |                                                                     |
| • Diagnostic functions                                               |                                                                     | Yes                                                                 |                                                                     |
| • Diagnostic information readable                                    |                                                                     | Yes                                                                 | Yes                                                                 |
| • Wire break                                                         |                                                                     | No                                                                  |                                                                     |
| • Short circuit                                                      | Yes                                                                 | Yes                                                                 | Yes                                                                 |
| • Group error                                                        | Yes                                                                 | Yes                                                                 | Yes                                                                 |
| Diagnostic indication LED                                            |                                                                     |                                                                     |                                                                     |
| • Group error SF (red)                                               | Yes                                                                 | Yes                                                                 | Yes                                                                 |
| <b>Isolation</b>                                                     |                                                                     |                                                                     |                                                                     |
| Isolation checked with                                               |                                                                     |                                                                     | 500 V DC                                                            |
| <b>Galvanic isolation</b>                                            |                                                                     |                                                                     |                                                                     |
| Galvanic isolation analog outputs                                    |                                                                     |                                                                     |                                                                     |
| • between the channels                                               | No                                                                  | No                                                                  | No                                                                  |
| • between the channels and the backplane bus                         | Yes                                                                 | Yes                                                                 | Yes                                                                 |
| • between the channels and the load voltage L+                       | Yes                                                                 | Yes                                                                 | Yes                                                                 |
| <b>Permissible potential difference</b>                              |                                                                     |                                                                     |                                                                     |
| between MANA and M internally (UISO)                                 | 75 V DC / 60 V AC                                                   | 75 V DC / 60 V AC                                                   | 75 V DC / 60 V AC                                                   |
| <b>Dimensions and weight</b>                                         |                                                                     |                                                                     |                                                                     |
| Dimensions                                                           |                                                                     |                                                                     |                                                                     |
| • Width                                                              | 15 mm                                                               | 15 mm                                                               | 15 mm                                                               |
| • Height                                                             | 81 mm                                                               | 81 mm                                                               | 81 mm                                                               |
| • Depth                                                              | 52 mm                                                               | 52 mm                                                               | 52 mm                                                               |
| Weight                                                               |                                                                     |                                                                     |                                                                     |
| • Weight, approx.                                                    | 40 g                                                                | 40 g                                                                | 40 g                                                                |

## Technical specifications (continued)

|                                                                     | 6ES7 135-4GB01-0AB0                                                     | 6ES7 135-4MB02-0AB0      | 6ES7 135-4GB52-0AB0                                                        |
|---------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------|
| <b>Supply voltages</b>                                              |                                                                         |                          |                                                                            |
| Load voltage L+                                                     |                                                                         |                          |                                                                            |
| • Rated value (DC)                                                  | 24 V; from power module                                                 | 24 V                     | 24 V                                                                       |
| • Reverse polarity protection                                       | Yes                                                                     | Yes                      | Yes                                                                        |
| <b>Current consumption</b>                                          |                                                                         |                          |                                                                            |
| from load voltage L+ (without load), max.                           | 150 mA                                                                  | 80 mA                    | 150 mA; with load                                                          |
| from backplane bus 3.3 V DC, max.                                   | 10 mA                                                                   | 10 mA                    | 10 mA                                                                      |
| <b>Power losses</b>                                                 |                                                                         |                          |                                                                            |
| Power loss, max.                                                    | 2 W                                                                     | 1.2 W                    | 2.4 W; typical                                                             |
| <b>Address area</b>                                                 |                                                                         |                          |                                                                            |
| Address space per module                                            |                                                                         |                          |                                                                            |
| • Address space per module, max.                                    | 4 byte                                                                  | 4 byte                   | 4 byte                                                                     |
| <b>Isochronous mode</b>                                             |                                                                         |                          |                                                                            |
| Isochronous mode                                                    |                                                                         | Yes                      | Yes                                                                        |
| <b>Analog outputs</b>                                               |                                                                         |                          |                                                                            |
| Number of analog outputs                                            | 2                                                                       | 2                        | 2                                                                          |
| Cable length, shielded, max.                                        | 200 m                                                                   | 200 m; 100m if Twa < 2ms | 200 m; max. 20m for TWA 100µs                                              |
| Current output, no-load voltage, max.                               | 18 V                                                                    | 18 V                     | 18 V                                                                       |
| Cycle time (all channels) max.                                      | 1.5 ms                                                                  | 0.5 ms                   | 250 µs                                                                     |
| Output ranges, current                                              |                                                                         |                          |                                                                            |
| • -20 to +20 mA                                                     | Yes                                                                     | Yes                      | Yes                                                                        |
| • 4 to 20 mA                                                        | Yes                                                                     | Yes                      | Yes                                                                        |
| Connection of actuators                                             |                                                                         |                          |                                                                            |
| • for current output 2-conductor connection                         | Yes                                                                     | Yes                      | Yes                                                                        |
| • for current output 4-conductor connection                         | No                                                                      | No                       |                                                                            |
| Load impedance (in rated range of output)                           |                                                                         |                          |                                                                            |
| • with current outputs, max.                                        | 500 Ω                                                                   | 500 Ω                    | 500 Ω                                                                      |
| • with current outputs, inductive load, max.                        | 1 mH                                                                    | 1 mH                     | 1 mH; for TWA 100µs                                                        |
| Destruction limits against externally applied voltages and currents |                                                                         |                          |                                                                            |
| • Voltages at the outputs towards MANA                              | 15 V; max. 15 V permanent; 75 V for max. 1 s (mark to space ratio 1:20) |                          |                                                                            |
| • Current, max.                                                     | 50 mA; DC                                                               | 50 mA                    | 15 mA; max. 15 V/5 hours (higher voltages not permissible even briefly)    |
| <b>Analog value creation</b>                                        |                                                                         |                          |                                                                            |
| Integrations and conversion time/ resolution per channel            |                                                                         |                          |                                                                            |
| • Resolution with overrange (bit including sign), max.              | 14 bit; 4 to 20 mA: 13 bit, +/-20 mA: 14 bit                            | 16 bit                   | 16 bit                                                                     |
| Settling time                                                       |                                                                         |                          |                                                                            |
| • for resistive load                                                | 0.1 ms                                                                  | 0.3 ms                   | 0.05 ms                                                                    |
| • for capacitive load                                               | 0.5 ms                                                                  | 1 ms                     | 0.05 ms; at a load of up to 500 Ohm/100 nF and a max. cable length of 20 m |
| • for inductive load                                                | 0.5 ms                                                                  | 0.5 ms                   | 0.05 ms                                                                    |
| <b>Ex(i) characteristics</b>                                        |                                                                         |                          |                                                                            |
| Max. values of output circuits (per channel)                        |                                                                         |                          |                                                                            |
| • Uo (output no-load voltage), max.                                 | 18 V                                                                    |                          |                                                                            |

## SIMATIC ET 200 distributed I/O

## ET 200S

## I/O modules

## Analog electronic modules

## Technical specifications (continued)

|                                                                      | 6ES7 135-4GB01-0AB0                                                    | 6ES7 135-4MB02-0AB0                                                    | 6ES7 135-4GB52-0AB0                                                                                                                                            |
|----------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Errors/accuracies</b>                                             |                                                                        |                                                                        |                                                                                                                                                                |
| Output ripple (based on output area, bandwidth 0 to 50 kHz)          | +/- 0.02 %                                                             | +/- 0.02 %                                                             | +/- 0.02 %                                                                                                                                                     |
| Linearity error (relative to output area)                            | +/- 0.02 %                                                             | +/- 0.01 %                                                             | +/- 0.03 %; with resistive load                                                                                                                                |
| Temperature error (relative to output area)                          | +/- 0.01 %/K                                                           | +/- 0.003 %/K                                                          | +/- 0.01 %/K                                                                                                                                                   |
| Crosstalk between the outputs, min.                                  |                                                                        | 60 dB                                                                  | -60 dB                                                                                                                                                         |
| Repeat accuracy in settled status at 25 °C (relative to output area) | +/- 0.05 %                                                             | +/- 0.01 %                                                             | +/- 0.03 %                                                                                                                                                     |
| Operational limit in overall temperature range                       |                                                                        |                                                                        |                                                                                                                                                                |
| • Current, relative to output area                                   | +/- 0.5 %                                                              | +/- 0.1 %                                                              | +/- 0.2 %; Specified value applies for loads from 200 to 350 Ohm, deviating operational limits for loads up to 200 Ohm and from 350 to 500 Ohm with up to 0.4% |
| Basic error limit (operational limit at 25 °C)                       |                                                                        |                                                                        |                                                                                                                                                                |
| • Current, relative to output area                                   | +/- 0.3 %                                                              | +/- 0.05 %                                                             | +/- 0.1 %; Specified value applies for loads from 200 to 350 Ohm, deviating basic error limits for loads up to 200 Ohm and from 350 to 500 Ohm with up to 0.3% |
| <b>Parameter</b>                                                     |                                                                        |                                                                        |                                                                                                                                                                |
| Remark                                                               | 7 byte                                                                 | 7 byte                                                                 | 7 byte                                                                                                                                                         |
| Output type/range                                                    | deactivated / +/-20 mA / 4 to 20 mA                                    | deactivated / +/-20 mA / 4 to 20 mA                                    | deactivated / +/-20 mA / 4 to 20 mA                                                                                                                            |
| Diagnostics: wire break                                              | Disable / enable                                                       | Disable / enable                                                       | Disable / enable                                                                                                                                               |
| Interference frequency suppression                                   |                                                                        | disable / enable                                                       |                                                                                                                                                                |
| Group diagnostics                                                    | Disable / enable                                                       | Disable / enable                                                       | Disable / enable                                                                                                                                               |
| Behavior on CPU/Master STOP                                          | Output current and de-energized/<br>substitute a value/keep last value | Output current and de-energized/<br>substitute a value/keep last value | Output current and de-energized/<br>substitute a value/keep last value                                                                                         |
| <b>Alarms/diagnostics/status information</b>                         |                                                                        |                                                                        |                                                                                                                                                                |
| Substitute values connectable                                        | Yes; 0 to 65535 (range of values must be within the rated range)       | Yes                                                                    | Yes                                                                                                                                                            |
| Diagnostics                                                          |                                                                        |                                                                        |                                                                                                                                                                |
| • Diagnostic functions                                               |                                                                        |                                                                        | Yes                                                                                                                                                            |
| • Diagnostic information readable                                    |                                                                        | Yes                                                                    | Yes                                                                                                                                                            |
| • Wire break                                                         | Yes                                                                    | Yes                                                                    | Yes                                                                                                                                                            |
| • Group error                                                        | Yes                                                                    | Yes                                                                    | Yes                                                                                                                                                            |
| Diagnostic indication LED                                            |                                                                        |                                                                        |                                                                                                                                                                |
| • Group error SF (red)                                               | Yes                                                                    | Yes                                                                    | Yes                                                                                                                                                            |
| <b>Isolation</b>                                                     |                                                                        |                                                                        |                                                                                                                                                                |
| Isolation checked with                                               |                                                                        | 500 V DC                                                               | 500 V DC                                                                                                                                                       |
| <b>Galvanic isolation</b>                                            |                                                                        |                                                                        |                                                                                                                                                                |
| Galvanic isolation analog outputs                                    |                                                                        |                                                                        |                                                                                                                                                                |
| • Galvanic isolation analog outputs                                  |                                                                        | Yes                                                                    | Yes                                                                                                                                                            |
| • between the channels                                               | No                                                                     | No                                                                     | No                                                                                                                                                             |
| • between the channels and the backplane bus                         | Yes                                                                    | Yes                                                                    | Yes                                                                                                                                                            |
| • between the channels and the load voltage L+                       | Yes                                                                    | Yes                                                                    | Yes                                                                                                                                                            |

## Technical specifications (continued)

|                                                                                     | 6ES7 135-4GB01-0AB0 | 6ES7 135-4MB02-0AB0 | 6ES7 135-4GB52-0AB0 |
|-------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|
| <b>Permissible potential difference</b><br>between MANA and M internally<br>(UIISO) | 75 V DC / 60 V AC   | 75 V DC / 60 V AC   | 75 V DC / 60 V AC   |
| <b>Dimensions and weight</b>                                                        |                     |                     |                     |
| Dimensions                                                                          |                     |                     |                     |
| • Width                                                                             | 15 mm               | 15 mm               | 15 mm               |
| • Height                                                                            | 81 mm               | 81 mm               | 81 mm               |
| • Depth                                                                             | 52 mm               | 52 mm               | 52 mm               |
| Weight                                                                              |                     |                     |                     |
| • Weight, approx.                                                                   | 40 g                | 40 g                | 45 g                |

## Ordering data

## Order No.

## Order No.

## Analog input modules

- Ordering unit 1 unit
- 2 AI U High Speed
  - 2 AI U Standard
  - 2 AI U High Feature
  - 2 AI I Standard 2-wire
  - 2 AI I High Speed 2-wire
  - 2 AI High Speed 4-wire
  - 2 AI I Standard 4-wire
  - 2 AI I High Feature 2-wire/4-wire  
(15 bit + sign)
  - 2 AI RTD standard
  - 2 AI TC Standard
  - 2 AI RTD High Feature
  - 2 AI TC High Feature
  - 4 AI Standard 2-wire
  - 4 AI TC Standard

6ES7 134-4FB52-0AB0  
6ES7 134-4FB01-0AB0  
6ES7 134-4LB02-0AB0  
6ES7 134-4GB01-0AB0  
6ES7 134-4GB52-0AB0  
6ES7 134-4GB62-0AB0  
6ES7 134-4GB11-0AB0  
6ES7 134-4MB02-0AB0  
  
6ES7 134-4JB51-0AB0  
6ES7 134-4JB01-0AB0  
6ES7 134-4NB51-0AB0  
6ES7 134-4NB01-0AB0  
6ES7 134-4GD00-0AB0  
6ES7 134-4JD00-0AB0

## Analog output modules

- Ordering unit 1 unit
- 2 AO U Standard
  - 2 AO U High Speed
  - 2 AO U High Feature
  - 2 AO I Standard
  - 2 AO I High Speed
  - 2 AO I High Feature

6ES7 135-4FB01-0AB0  
6ES7 135-4FB52-0AB0  
6ES7 135-4LB02-0AB0  
6ES7 135-4GB01-0AB0  
6ES7 135-4GB52-0AB0  
6ES7 135-4MB02-0AB0

## Accessories for labeling

## Label sheets DIN A4 (10 units)

Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules

- petrol
- red
- yellow
- light beige

6ES7 193-4BH00-0AA0  
6ES7 193-4BD00-0AA0  
6ES7 193-4BB00-0AA0  
6ES7 193-4BA00-0AA0

## Accessories for system-integrated shield connection

## Shield connection element

Ordering unit 5 units  
For plugging into TM-E and TM-P

6ES7 193-4GA00-0AA0

## Shield clamps

Ordering unit 5 units  
For 3 × 10 mm busbars

6ES7 193-4GB00-0AA0

## Grounding terminal

Ordering unit 1 unit  
For cable cross-sections up to 25 mm<sup>2</sup>

8WA2 868

## 3 × 10 mm busbars

Ordering unit 1 unit

8WA2 842

I: Subject to export regulations AL: N and ECCN: EAR99H

## SIMATIC ET 200 distributed I/O

## ET 200S

Technology modules  
SSI module

## Overview



- 1-channel module for connecting SSI sensors to the ET 200S
- For position decoding and simple positioning tasks
- With two comparison operations with specifiable comparison values (standard mode)
- With a digital input for latching actual values (standard mode)
- Can be plugged into TM-E terminal module with automatic coding
- Fast mode for high-speed acquisition of encoder values (e.g. for drive controls)
- Module replacement possible during operation and when live (hot swapping)
- Simple parameterization without additional software

**Note:**

We supply positioning systems and prepared connection cables for counting and positioning functions as SIMODRIVE Sensors or Motion Connect 500 (also visit [www.siemens.com/simatic-technology](http://www.siemens.com/simatic-technology))

## Technical specifications

| 6ES7 138-4DB03-0AB0                       |        |
|-------------------------------------------|--------|
| <b>Supply voltages</b>                    |        |
| Load voltage L+                           |        |
| • Rated value (DC)                        | 24 V   |
| • permissible range, lower limit (DC)     | 20.4 V |
| • permissible range, upper limit (DC)     | 28.8 V |
| • Reverse polarity protection             | Yes    |
| <b>Current consumption</b>                |        |
| from load voltage L+ (without load), max. | 40 mA  |
| <b>Power losses</b>                       |        |
| Power loss, typ.                          | 1 W    |
| <b>Hardware configuration</b>             |        |
| Module exchange                           |        |
| • Hot swapping the IM-DP                  | Yes    |
| • Module exchange under process voltage   | Yes    |

| 6ES7 138-4DB03-0AB0                                    |                                    |
|--------------------------------------------------------|------------------------------------|
| <b>Digital inputs</b>                                  |                                    |
| Number of digital inputs                               | 1                                  |
| Input voltage                                          |                                    |
| • for signal "0"                                       | -30 to +5 V                        |
| • for signal "1"                                       | 11 to 30 V                         |
| Input current                                          |                                    |
| • for signal "0", max. (permissible quiescent current) | 2 mA                               |
| • for signal "1", typ.                                 | 9 mA                               |
| Cable length                                           |                                    |
| • Cable length, shielded, max.                         | 50 m                               |
| <b>Encoder supply</b>                                  |                                    |
| 24 V encoder supply                                    |                                    |
| • 24 V                                                 | Yes                                |
| • Short-circuit protection                             | Yes                                |
| • Output current, max.                                 | 500 mA                             |
| Absolute encoder (SSI) encoder supply                  |                                    |
| • Absolute encoder (SSI)                               | Yes                                |
| • Output voltage                                       | L+ (-0.8 V)                        |
| • Output current, max.                                 | 500 mA                             |
| - Short-circuit protection                             | Yes                                |
| <b>Encoder</b>                                         |                                    |
| Number of connectable encoders, max.                   | 1                                  |
| Connectable encoders                                   |                                    |
| • Absolute encoder (SSI)                               | Yes                                |
| Encoder signals, absolute encoder (SSI)                |                                    |
| • Telegram length                                      | 13, 14, 16, 21, 24 & 25 bit        |
| • Binary code                                          | Yes                                |
| • Gray code                                            | Yes                                |
| • Cable length, shielded, max.                         | 320 m; At 125 kHz                  |
| • Monoflop time                                        | 16/32/48/64 µs                     |
| <b>Alarms/diagnostics/status information</b>           |                                    |
| Diagnostic indication LED                              |                                    |
| • Group error SF (red)                                 | Yes                                |
| • Status indicator digital input (green)               | Yes                                |
| • Status indicator backward counting (green)           | Yes                                |
| • Status indicator forward counting (green)            | Yes                                |
| <b>Galvanic isolation</b>                              |                                    |
| Galvanic isolation digital inputs                      |                                    |
| • Galvanic isolation digital inputs                    | No; same potential with L+ and SSI |
| Galvanic isolation counter                             |                                    |
| • between the channels and the backplane bus           | Yes                                |
| • between the channels and the load voltage L+         | No                                 |
| <b>Dimensions and weight</b>                           |                                    |
| Dimensions                                             |                                    |
| • Width                                                | 15 mm                              |
| • Height                                               | 81 mm                              |
| • Depth                                                | 52 mm                              |
| Weight                                                 |                                    |
| • Weight, approx.                                      | 40 g                               |

| Ordering data                                                                                                                                                                                                                                             | Order No.                                                                                                            |                                                                                                            | Order No.                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>SSI module</b><br>for connecting absolute encoders with an SSI interface                                                                                                                                                                               | <b>6ES7 138-4DB03-0AB0</b>                                                                                           | <b>Signal cable</b><br>Preassembled for SSI absolute encoder 6FX2001-5, without Sub-D connector, UL/DESINA | <b>6FX5 002-2CC12-....</b> |
| <b>Accessories</b>                                                                                                                                                                                                                                        |                                                                                                                      |                                                                                                            |                            |
| <b>Label sheets DIN A4 (10 units)</b><br>Each sheet contains 60 label strips for I/O modules and 20 label strips for interface modules <ul style="list-style-type: none"> <li>• petrol</li> <li>• red</li> <li>• yellow</li> <li>• light beige</li> </ul> | <b>6ES7 193-4BH00-0AA0</b><br><b>6ES7 193-4BD00-0AA0</b><br><b>6ES7 193-4BB00-0AA0</b><br><b>6ES7 193-4BA00-0AA0</b> |                                                                                                            |                            |

# SIMATIC ET 200 distributed I/O

## ET 200S

### Technology modules

#### 2 PULSE pulse generator

#### Overview



- 2-channel pulse generator and timer module for ET 200S
- For controlling final control elements, valves, heating elements, etc.
- Pulse-width modulation (PWM)
- Pulse trains
- Pulse chains
- Frequency output
- Time-precise switching signals to 24 V DC output
- Measurement of output current
- Isochronous mode

#### Technical specifications

| 6ES7 138-4DD01-0AB0                                   |                         |
|-------------------------------------------------------|-------------------------|
| <b>Supply voltages</b>                                |                         |
| Load voltage L+                                       |                         |
| • Rated value (DC)                                    | 24 V; from power module |
| • Reverse polarity protection                         | Yes                     |
| <b>Current consumption</b>                            |                         |
| from load voltage L+ (without load), max.             | 40 mA                   |
| from backplane bus 3.3 V DC, max.                     | 10 mA                   |
| <b>Power losses</b>                                   |                         |
| Power loss, typ.                                      | 1.8 W                   |
| <b>Digital inputs</b>                                 |                         |
| Number of digital inputs                              | 2                       |
| Input characteristic curve acc. to IEC 1131, Type 2   | Yes                     |
| Input voltage                                         |                         |
| • Rated value, DC                                     | 24 V                    |
| • for signal "0"                                      | -30 to +5 V             |
| • for signal "1"                                      | 11 to 30 V              |
| Input current                                         |                         |
| • for signal "1", typ.                                | 9 mA                    |
| Input delay (for rated value of input voltage)        |                         |
| • Input frequency (with a time delay of 0.1 ms), max. | 20 kHz                  |
| • Minimum pulse width for program reactions           | 100 µs                  |

| 6ES7 138-4DD01-0AB0                                     |                                                                    |
|---------------------------------------------------------|--------------------------------------------------------------------|
| Cable length                                            |                                                                    |
| • Cable length, shielded, max.                          | 100 m                                                              |
| <b>Digital outputs</b>                                  |                                                                    |
| Number of digital outputs                               | 2                                                                  |
| Short-circuit protection                                | Yes                                                                |
| • Response threshold, typ.                              | 10 A                                                               |
| Limitation of inductive shutdown voltage to             | L+ (-50 to -65 V)                                                  |
| Lamp load, max.                                         | 10 W                                                               |
| Accuracy of pulse duration                              | +/- (time period x 100 ppm),<br>+/- 100 µs with a load<br>≤ 50 Ohm |
| Minimum pulse duration                                  | 100 µs                                                             |
| Controlling a digital input                             | Yes                                                                |
| Output voltage                                          |                                                                    |
| • for signal "1", min.                                  | L+ (-1 V)                                                          |
| Output current                                          |                                                                    |
| • for signal "1" rated value                            | 2 A                                                                |
| • for signal "1" permissible range for 0 to 60 °C, min. | 7 mA                                                               |
| • for signal "1" permissible range for 0 to 60 °C, max. | 2 A                                                                |
| • for signal "0" residual current, max.                 | 0.5 mA                                                             |
| Output delay with resistive load                        |                                                                    |
| • 0 to "1", max.                                        | 100 µs                                                             |
| • 1 to "0", max.                                        | 200 µs                                                             |
| Switching frequency                                     |                                                                    |
| • with resistive load, max.                             | 5 kHz                                                              |
| • with inductive load, max.                             | 2 Hz                                                               |
| • on lamp load, max.                                    | 10 Hz                                                              |
| Cable length                                            |                                                                    |
| • Cable length, shielded, max.                          | 1 000 m                                                            |
| • Cable length unshielded, max.                         | 600 m                                                              |
| <b>Encoder supply</b>                                   |                                                                    |
| Output voltage                                          | L+ (-0.8 V)                                                        |
| Output current, rated value                             | 500 mA                                                             |
| Short-circuit protection                                | Yes                                                                |
| <b>Encoder</b>                                          |                                                                    |
| Connectable encoders                                    |                                                                    |
| • 2-wire BEROS                                          | Yes                                                                |
| - permissible quiescent current (2-wire BEROS), max.    | 2 mA                                                               |
| <b>Pulse generator</b>                                  |                                                                    |
| Number of channels                                      | 2; 1 digital input and 1 digital output per channel                |
| <b>Alarms/diagnostics/status information</b>            |                                                                    |
| Diagnostic indication LED                               |                                                                    |
| • Group error SF (red)                                  | Yes                                                                |
| • Status indicator digital output (green)               | Yes                                                                |
| • Status indicator digital input (green)                | Yes                                                                |

**Technical specifications** (continued)

| 6ES7 138-4DD01-0AB0                                                   |                   |
|-----------------------------------------------------------------------|-------------------|
| <b>Isolation</b>                                                      |                   |
| Isolation checked with                                                | 500 V DC          |
| <b>Galvanic isolation</b>                                             |                   |
| Galvanic isolation digital inputs                                     |                   |
| • between the channels                                                | No                |
| • between the channels and the backplane bus                          | Yes               |
| Galvanic isolation digital outputs                                    |                   |
| • between the channels                                                | No                |
| • between the channels and the backplane bus                          | Yes               |
| <b>Permissible potential difference</b><br>between different circuits | 75 V DC / 60 V AC |
| <b>Dimensions and weight</b>                                          |                   |
| Dimensions                                                            |                   |
| • Width                                                               | 15 mm             |
| • Height                                                              | 81 mm             |
| • Depth                                                               | 52 mm             |
| Weight                                                                |                   |
| • Weight, approx.                                                     | 40 g              |

**Ordering data**

|                                                                                                                    |                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Pulse generator and timer module 2PULSE</b>                                                                     | <b>6ES7 138-4DD01-0AB0</b>                                                                                           |
| For ET 200S                                                                                                        |                                                                                                                      |
| <b>Accessories</b>                                                                                                 |                                                                                                                      |
| <b>Label sheets DIN A4 (10 units)</b>                                                                              |                                                                                                                      |
| Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules                |                                                                                                                      |
| <ul style="list-style-type: none"> <li>• petrol</li> <li>• red</li> <li>• yellow</li> <li>• light beige</li> </ul> |                                                                                                                      |
|                                                                                                                    | <b>6ES7 193-4BH00-0AA0</b><br><b>6ES7 193-4BD00-0AA0</b><br><b>6ES7 193-4BB00-0AA0</b><br><b>6ES7 193-4BA00-0AA0</b> |



# SIMATIC ET 200 distributed I/O

## ET 200S

### Technology modules

#### 1STEP stepper module

#### Overview



- 1-channel module for ET 200S for controlled positioning of a stepper motor
- Operating modes: absolute and relative positioning, reference point approach, set reference point and speed mode
- Connection of power units with pulse/direction interface by means of 5 V differential signals up to 510 kHz
- External stop with/without ramp via digital input
- Status display and error indication via LEDs: Errors during positioning and statuses of the digital inputs are indicated by means of LEDs and displayed at the interface to the master
- Isochronous mode

| 6ES7 138-4DC01-0AB0                          |                                                                                        |
|----------------------------------------------|----------------------------------------------------------------------------------------|
| <b>Encoder</b>                               |                                                                                        |
| Connectable encoders                         | Yes                                                                                    |
| • 2-wire BEROs                               |                                                                                        |
| <b>Drive technology</b>                      |                                                                                        |
| Cable length, max.                           | 100 m; twisted and shielded in pairs                                                   |
| <b>Step-by-step controllers</b>              |                                                                                        |
| Connection for stepper motors                | Differential signals for pulses (PULSE, notPULSE) and direction (DIR, notDIR) to RS422 |
| Number of stepper motor channels             | 1                                                                                      |
| <b>Alarms/diagnostics/status information</b> |                                                                                        |
| Diagnostic indication LED                    |                                                                                        |
| • Description                                | 1 green LED for status indication "Ready for positioning jobs"                         |
| • Positioning mode POS (green)               | Yes                                                                                    |
| • Group error SF (red)                       | Yes                                                                                    |
| • Status indicator digital input (green)     | Yes                                                                                    |
| <b>Dimensions and weight</b>                 |                                                                                        |
| Dimensions                                   |                                                                                        |
| • Width                                      | 15 mm                                                                                  |
| • Height                                     | 81 mm                                                                                  |
| • Depth                                      | 52 mm                                                                                  |
| Weight                                       |                                                                                        |
| • Weight, approx.                            | 40 g                                                                                   |

#### Technical specifications

| 6ES7 138-4DC01-0AB0                                    |                                                                |
|--------------------------------------------------------|----------------------------------------------------------------|
| <b>Supply voltages</b>                                 |                                                                |
| Load voltage L+                                        |                                                                |
| • Rated value (DC)                                     | 24 V                                                           |
| <b>Power losses</b>                                    |                                                                |
| Power loss, typ.                                       | 1.5 W                                                          |
| <b>Digital inputs</b>                                  |                                                                |
| Number of digital inputs                               | 2                                                              |
| Functions                                              | Reference cams, pulse suppression, external stop, limit switch |
| Repeat frequency, max.                                 | 100 Hz                                                         |
| Input characteristic curve acc. to IEC 1131, Type 2    | Yes                                                            |
| Input voltage                                          |                                                                |
| • Rated value, DC                                      | 24 V                                                           |
| • for signal "0"                                       | -30 to +5 V (-15% / +20%)                                      |
| • for signal "1"                                       | 11 to 30 V                                                     |
| Input current                                          |                                                                |
| • for signal "0", max. (permissible quiescent current) | 2 mA                                                           |
| • for signal "1", typ.                                 | 9 mA                                                           |
| Input delay (for rated value of input voltage)         |                                                                |
| • for standard inputs                                  |                                                                |
| - at "0" to "1", max.                                  | 4 ms                                                           |
| - at "1" to "0", max.                                  | 4 ms                                                           |
| Cable length                                           |                                                                |
| • Cable length, shielded, max.                         | 1 000 m                                                        |
| • Cable length unshielded, max.                        | 600 m                                                          |

#### Ordering data

#### Order No.

|                                                                                                     |                            |
|-----------------------------------------------------------------------------------------------------|----------------------------|
| <b>1STEP stepper module</b>                                                                         | <b>6ES7 138-4DC01-0AB0</b> |
| for simple positioning tasks with stepper motor axes                                                |                            |
| <b>Accessories</b>                                                                                  |                            |
| <b>Label sheets DIN A4 (10 units)</b>                                                               |                            |
| Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules |                            |
| • petrol                                                                                            | <b>6ES7 193-4BH00-0AA0</b> |
| • red                                                                                               | <b>6ES7 193-4BD00-0AA0</b> |
| • yellow                                                                                            | <b>6ES7 193-4BB00-0AA0</b> |
| • light beige                                                                                       | <b>6ES7 193-4BA00-0AA0</b> |

I: Subject to export regulations AL: N and ECCN: EAR99H

## Overview



- The positioning module 1 POS U is a single-channel positioning module for ET 200S for positioning of adjusting and operating axes
- For controlled positioning by means of digital outputs according to the rapid traverse/creep speed principle
- With position value recording for
  - Incremental encoders with 5 V differential signals or 24 V signals or for SSI encoders
  - Dosing operation (single evaluation of encoder signal A only)
- Reference point approach, set actual value
- Parameter change during operation
  - Switchover difference
  - Switch-off difference
- Functions
  - Jog:
    - Direct specification of control signals by the master
  - Travel:
    - Absolute or relative
  - Axes:
    - For linear and rotary axes
  - Latch function:
    - Saving the current actual value by setting a digital input

### Note

We offer position measuring systems and preassembled connecting cables for counting and positioning functions under the names SIMODRIVE Sensor or Motion Connect 500.

## Technical specifications

| 6ES7 138-4DL00-0AB0                                 |        |
|-----------------------------------------------------|--------|
| <b>Supply voltages</b>                              |        |
| Load voltage L+                                     |        |
| • Rated value (DC)                                  | 24 V   |
| • permissible range, lower limit (DC)               | 20.4 V |
| • permissible range, upper limit (DC)               | 28.8 V |
| • Reverse polarity protection                       | Yes    |
| <b>Current consumption</b>                          |        |
| from load voltage L+ (without load), max.           | 50 mA  |
| from backplane bus 3.3 V DC, max.                   | 10 mA  |
| <b>Power losses</b>                                 |        |
| Power loss, typ.                                    | 2 W    |
| <b>Digital inputs</b>                               |        |
| Input characteristic curve acc. to IEC 1131, Type 2 | Yes    |

| 6ES7 138-4DL00-0AB0                                     |                       |
|---------------------------------------------------------|-----------------------|
| <b>Input voltage</b>                                    |                       |
| • Rated value, DC                                       | 24 V                  |
| • for signal "0"                                        | -30 to +5 V           |
| • for signal "1"                                        | 11 to 30 V            |
| <b>Input current</b>                                    |                       |
| • for signal "0", max. (permissible quiescent current)  | 2 mA                  |
| • for signal "1", typ.                                  | 9 mA                  |
| <b>Cable length</b>                                     |                       |
| • Cable length unshielded, max.                         | 50 m                  |
| <b>Digital outputs</b>                                  |                       |
| Short-circuit protection                                | Yes                   |
| • Response threshold, typ.                              | 0.7 to 1.8 A          |
| Limitation of inductive shutdown voltage to             | yes; L+ -(55 to 60 V) |
| Lamp load, max.                                         | 5 W                   |
| Controlling a digital input                             | Yes                   |
| <b>Output voltage</b>                                   |                       |
| • Rated value (DC)                                      | 24 V                  |
| • for signal "0" (DC), max.                             | 3 V                   |
| • for signal "1", min.                                  | L+ (-1 V)             |
| <b>Output current</b>                                   |                       |
| • for signal "1" permissible range for 0 to 60 °C, min. | 7 mA                  |
| • for signal "1" permissible range for 0 to 60 °C, max. | 600 mA                |
| • for signal "0" residual current, max.                 | 0.3 mA                |
| <b>Output delay with resistive load</b>                 |                       |
| • 0 to "1", max.                                        | typically 150 µs      |
| • 1 to "0", max.                                        | typically 150 µs      |
| <b>Switching frequency</b>                              |                       |
| • with resistive load, max.                             | 100 Hz                |
| • with inductive load, max.                             | 2 Hz                  |
| • on lamp load, max.                                    | 10 Hz                 |
| <b>Cable length</b>                                     |                       |
| • Cable length, shielded, max.                          | 1 000 m               |
| • Cable length unshielded, max.                         | 600 m                 |
| <b>Encoder supply</b>                                   |                       |
| 5 V encoder supply                                      |                       |
| • 5 V                                                   | No                    |
| 24 V encoder supply                                     |                       |
| • 24 V                                                  | Yes                   |
| • Short-circuit protection                              | Yes                   |
| • Output current, max.                                  | 500 mA                |
| <b>Absolute encoder (SSI) encoder supply</b>            |                       |
| • Absolute encoder (SSI)                                | Yes                   |
| • Output voltage                                        | L+ (-0.8 V)           |
| • Output current, max.                                  | 500 mA                |
| • Cable length, max.                                    |                       |
| - Short-circuit protection                              | Yes                   |
| <b>Encoder</b>                                          |                       |
| Number of connectable encoders, max.                    | 1                     |
| <b>Connectable encoders</b>                             |                       |
| • Incremental encoder (symmetrical)                     | Yes                   |
| • Incremental encoder (asymmetrical)                    | Yes                   |
| • Absolute encoder (SSI)                                | Yes                   |
| • 2-wire BEROs                                          | Yes; type 2           |

## SIMATIC ET 200 distributed I/O

## ET 200S

Technology modules  
1 POS U positioning module

## Technical specifications (continued)

| 6ES7 138-4DL00-0AB0                                                   |                                                                                                                                      |
|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Encoder signals, incremental encoder (symmetrical)                    |                                                                                                                                      |
| • Encoder signal 5 V                                                  |                                                                                                                                      |
| - Signal level                                                        | to RS-422                                                                                                                            |
| - Terminating resistor                                                | 330 Ω                                                                                                                                |
| - Differential input voltage, min.                                    | 1 V                                                                                                                                  |
| - Input frequency, max.                                               | 500 kHz                                                                                                                              |
| - Cable length, shielded, max.                                        | 50 m                                                                                                                                 |
| • Encoder signal 24 V                                                 |                                                                                                                                      |
| - Rated value 24 V DC                                                 | Yes                                                                                                                                  |
| - Input voltage for signal "0"                                        | 5 V                                                                                                                                  |
| - Input voltage for signal "1"                                        | 30 V                                                                                                                                 |
| - Input current, for signal "0", max. (permissible quiescent current) | 2 mA                                                                                                                                 |
| - Input current for signal "1", typ.                                  | 9 mA                                                                                                                                 |
| - Input frequency, max.                                               | 100 kHz                                                                                                                              |
| - Cable length, shielded, max.                                        | 50 m                                                                                                                                 |
| Encoder signals, absolute encoder (SSI)                               |                                                                                                                                      |
| • Cable length, shielded, max.                                        | 320 m at 125 kHz, 160 m at 250 kHz, 60 m at 500 kHz, 20 m at 1 MHz, 8 m at 2 MHz, twisted in pairs and shielded                      |
| • Updating the encoder value                                          |                                                                                                                                      |
| - Telegram runtime at 13 bit, min.                                    | 7 ms                                                                                                                                 |
| - Telegram runtime at 25 bit, min.                                    | 13 ms                                                                                                                                |
| • Monoflop time                                                       | 64 ms                                                                                                                                |
| <b>Response times</b>                                                 |                                                                                                                                      |
| Send cycle of the feedback messages                                   | 1 ms                                                                                                                                 |
| Latch                                                                 | In the case of incremental encoders: typ. 400 ms; in the case of SSI encoders: typ. 400 ms + age of the encoder value:               |
| Response time at switchover/switchoff time                            | In the case of incremental encoders: output delay + 30 μs; in the case of SSI encoders: output delay + message frame runtime + 30 ms |
| <b>Alarms/diagnostics/status information</b>                          |                                                                                                                                      |
| Diagnostic indication LED                                             |                                                                                                                                      |
| • Actual value falling DN (green)                                     | Yes                                                                                                                                  |
| • Actual value rising UP (green)                                      | Yes                                                                                                                                  |
| • Positioning mode POS (green)                                        | Yes                                                                                                                                  |
| • Group error SF (red)                                                | Yes                                                                                                                                  |
| • Status indicator digital input (green)                              | Yes                                                                                                                                  |
| <b>Galvanic isolation</b>                                             |                                                                                                                                      |
| between backplane bus and all other circuit components                | Yes                                                                                                                                  |
| between the channels and backplane bus                                | Yes                                                                                                                                  |
| <b>Dimensions and weight</b>                                          |                                                                                                                                      |
| Dimensions                                                            |                                                                                                                                      |
| • Width                                                               | 30 mm                                                                                                                                |
| • Height                                                              | 81 mm                                                                                                                                |
| • Depth                                                               | 52 mm                                                                                                                                |
| Weight                                                                |                                                                                                                                      |
| • Weight, approx.                                                     | 65 g                                                                                                                                 |

## Ordering data

## Order No.

## 1 POS U positioning module

6ES7 138-4DL00-0AB0

Single-channel positioning module for ET 200S for positioning the adjustment and operation axes

## Overview



- 1-channel 32-bit intelligent counter module for universal count tasks and time-based measuring tasks
- For the direct connection of 24 V incremental sensors or initiators
- Comparison function with predefinable comparison values
- Integrated digital output to output the reaction when the comparison value is attained
- Can be plugged into TM-E terminal module with automatic coding
- Module replacement possible during operation and under power (hot swapping)
- Simple parameterization without additional software

### Note:

Siemens is able to offer distance measuring systems and pre-assembled connecting cables for counting and positioning functions in the product ranges SIMODRIVE Sensor and Motion Connect 500.

## Technical specifications

| 6ES7 138-4DA04-0AB0                                    |                                                                 |
|--------------------------------------------------------|-----------------------------------------------------------------|
| <b>Supply voltages</b>                                 |                                                                 |
| Load voltage L+                                        |                                                                 |
| • Rated value (DC)                                     | 24 V                                                            |
| • permissible range, lower limit (DC)                  | 20.4 V                                                          |
| • permissible range, upper limit (DC)                  | 28.8 V                                                          |
| • Reverse polarity protection                          | Yes                                                             |
| <b>Current consumption</b>                             |                                                                 |
| from load voltage L+ (without load), max.              | 42 mA                                                           |
| from backplane bus 3.3 V DC, max.                      | 10 mA                                                           |
| <b>Power losses</b>                                    |                                                                 |
| Power loss, typ.                                       | 1 W                                                             |
| <b>Hardware configuration</b>                          |                                                                 |
| Module exchange                                        |                                                                 |
| • Hot swapping the IM-DP                               | Yes                                                             |
| • Module exchange under process voltage                | Yes                                                             |
| <b>Digital inputs</b>                                  |                                                                 |
| Number of digital inputs                               | 1                                                               |
| Functions                                              | Gate control, synchronization, latch function                   |
| Input characteristic curve acc. to IEC 1131, Type 2    | Yes                                                             |
| Input voltage                                          |                                                                 |
| • Rated value, DC                                      | 24 V                                                            |
| • for signal "0"                                       | -30 to +5 V                                                     |
| • for signal "1"                                       | 11 to 30 V                                                      |
| Input current                                          |                                                                 |
| • for signal "0", max. (permissible quiescent current) | 2 mA                                                            |
| • for signal "1", typ.                                 | 9 mA                                                            |
| Input delay (for rated value of input voltage)         |                                                                 |
| • for standard inputs<br>- at "0" to "1", max.         | 2.5 µs; Filter off: 2.5 µs (200 kHz), filter on: 25 µs (20 kHz) |
| Cable length                                           |                                                                 |
| • Cable length, shielded, max.                         | 100 m; Filter 20 kHz: 100 m, filter 200 kHz: 50 m               |

| 6ES7 138-4DA04-0AB0                                     |                          |
|---------------------------------------------------------|--------------------------|
| <b>Digital outputs</b>                                  |                          |
| Number of digital outputs                               | 1                        |
| Short-circuit protection                                | Yes                      |
| • Response threshold, typ.                              | 2.6 A to 4 A             |
| Limitation of inductive shutdown voltage to             | L+ (-50 to -60 V)        |
| Lamp load, max.                                         | 5 W                      |
| Controlling a digital input                             | Yes                      |
| Output voltage                                          |                          |
| • Rated value (DC)                                      | 24 V                     |
| • for signal "0" (DC), max.                             | 3 V                      |
| • for signal "1", min.                                  | L+ (-1 V)                |
| Output current                                          |                          |
| • for signal "1" permissible range for 0 to 40 °C, min. | 5 mA                     |
| • for signal "1" permissible range for 0 to 40 °C, max. | 2 000 mA                 |
| • for signal "1" permissible range for 0 to 60 °C, min. | 5 mA                     |
| • for signal "1" permissible range for 0 to 60 °C, max. | 500 mA; 1000 mA at 50 °C |
| • for signal "0" residual current, max.                 | 0.5 mA                   |
| Output delay with resistive load                        |                          |
| • 0 to "1", max.                                        | 100 µs                   |
| Switching frequency                                     |                          |
| • with resistive load, max.                             | 100 Hz                   |
| • with inductive load, max.                             | 2 Hz                     |
| • on lamp load, max.                                    | 10 Hz                    |
| Cable length                                            |                          |
| • Cable length, shielded, max.                          | 1 000 m                  |
| • Cable length unshielded, max.                         | 600 m                    |
| <b>Encoder supply</b>                                   |                          |
| 24 V encoder supply                                     |                          |
| • 24 V                                                  | Yes; L+ (-0.8 V)         |
| • Short-circuit protection                              | Yes                      |
| • Output current, max.                                  | 500 mA                   |
| <b>Encoder</b>                                          |                          |
| Number of connectable encoders, max.                    | 1                        |

# SIMATIC ET 200 distributed I/O

## ET 200S

### Technology modules

#### 1 COUNT 24 V/100 kHz counter module

#### Technical specifications (continued)

| 6ES7 138-4DA04-0AB0                          |                                                                    |
|----------------------------------------------|--------------------------------------------------------------------|
| Connectable encoders                         |                                                                    |
| • Incremental encoder (asymmetrical)         | Yes                                                                |
| • 24 V initiator                             | Yes                                                                |
| • 2-wire BEROs                               | Yes                                                                |
| <b>Counter</b>                               |                                                                    |
| Number of counter inputs                     | 1; 32 bit                                                          |
| Minimum pulse width                          | 2.5 µs; Filter off: 2.5 µs (200 kHz),<br>Filter on: 25 µs (20 kHz) |
| <b>Frequency measurement</b>                 |                                                                    |
| Measurement range, min.                      | 0.1 Hz                                                             |
| Measurement range, max.                      | 100 kHz                                                            |
| <b>Cycle duration measurement</b>            |                                                                    |
| Measuring range, lower limit                 | 10 µs                                                              |
| Measuring range, upper limit                 | 120 s                                                              |
| <b>Speed measurement</b>                     |                                                                    |
| Measurement range, min. (lower limit)        | 1 1/min                                                            |
| Measurement range, max. (upper limit)        | 25 000 1/min                                                       |
| <b>Parameter</b>                             |                                                                    |
| Remark                                       | 16 byte                                                            |
| <b>Alarms/diagnostics/status information</b> |                                                                    |
| Diagnostics                                  |                                                                    |
| • Diagnostic functions                       | Yes                                                                |

| 6ES7 138-4DA04-0AB0                            |                             |
|------------------------------------------------|-----------------------------|
| Diagnostic indication LED                      |                             |
| • Group error SF (red)                         | Yes                         |
| • Status indicator digital output (green)      | Yes                         |
| • Status indicator digital input (green)       | Yes                         |
| • Status indicator backward counting (green)   | Yes                         |
| • Status indicator forward counting (green)    | Yes                         |
| <b>Galvanic isolation</b>                      |                             |
| Galvanic isolation digital inputs              |                             |
| • Galvanic isolation digital inputs            | No; only opposite shielding |
| Galvanic isolation counter                     |                             |
| • between the channels and the backplane bus   | Yes                         |
| • between the channels and the load voltage L+ | No                          |
| <b>Dimensions and weight</b>                   |                             |
| Dimensions                                     |                             |
| • Width                                        | 15 mm                       |
| • Height                                       | 81 mm                       |
| • Depth                                        | 52 mm                       |
| Weight                                         |                             |
| • Weight, approx.                              | 40 g                        |

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#### Ordering data

#### Order No.

#### 1 COUNT 24 V/100 kHz counter module

For universal counting and measuring tasks with ET 200S

#### Accessories

#### Label sheets DIN A4 (10 units)

Each sheet contains 60 label strips for I/O modules and 20 label strips for interface modules

- petrol
- red
- yellow
- light beige

#### Shield connection element

For TM-P and TM-E terminal modules, as fixing for busbars 3 x 10 mm, 5 units

#### Shield clamps

For connecting braided cable shields to the busbar, 5 units

#### SIMODRIVE sensor incremental encoder

Externally mounted encoder, optical, incremental with HTL level, operating voltage 10 to 30 V

- With synchronous flange, universal axial/radial cable outlet with connector
  - 100 pulses/revolution
  - 500 pulses/revolution
  - 1000 pulses/revolution
  - 2500 pulses/revolution

6ES7 138-4DA04-0AB0

6ES7 193-4BH00-0AA0  
6ES7 193-4BD00-0AA0  
6ES7 193-4BB00-0AA0  
6ES7 193-4BA00-0AA0

6ES7 193-4GA00-0AA0

6ES7 193-4GB00-0AA0

6FX2 001-4DA10  
6FX2 001-4DA50  
6FX2 001-4DB00  
6FX2 001-4DC50

#### Order No.

- With synchronous flange, radial flange outlet
  - 100 pulses/revolution
  - 500 pulses/revolution
  - 1000 pulses/revolution
  - 2500 pulses/revolution

6FX2 001-4FA10  
6FX2 001-4FA50  
6FX2 001-4FB00  
6FX2 001-4FC50

- With synchronous flange, axial flange outlet
  - 100 pulses/revolution
  - 500 pulses/revolution
  - 1000 pulses/revolution
  - 2500 pulses/revolution

6FX2 001-4HA10  
6FX2 001-4HA50  
6FX2 001-4HB00  
6FX2 001-4HC50

- With clamping flange, universal axial/radial cable outlet with connector
  - 100 pulses/revolution
  - 500 pulses/revolution
  - 1000 pulses/revolution
  - 2500 pulses/revolution

6FX2 001-4NA10  
6FX2 001-4NA50  
6FX2 001-4NB00  
6FX2 001-4NC50

- With clamping flange, radial flange outlet
  - 100 pulses/revolution
  - 500 pulses/revolution
  - 1000 pulses/revolution
  - 2500 pulses/revolution

6FX2 001-4QA10  
6FX2 001-4QA50  
6FX2 001-4QB00  
6FX2 001-4QC50

- With clamping flange, axial flange outlet
  - 100 pulses/revolution
  - 500 pulses/revolution
  - 1000 pulses/revolution
  - 2500 pulses/revolution

6FX2 001-4SA10  
6FX2 001-4SA50  
6FX2 001-4SB00  
6FX2 001-4SC50

#### Signal cable

Pre-assembled for HTL and TTL encoder, without Sub-D connector, UL/DESINA

6FX5 002-2CA12-....

## Overview



- 1-channel 32-bit intelligent counter module for universal count tasks and time-based measuring tasks
- For direct connection of 5 V incremental encoders (RS 422)
- Comparison function with predefinable comparison values
- 2 integrated digital outputs to output the response upon reaching the comparison value
- Can be plugged into TM-E terminal module with automatic coding
- Module replacement possible during operation and under power (hot swapping)
- Simple parameterization without additional software

### Note:

Siemens is able to offer distance measuring systems and pre-assembled connecting cables for counting and positioning functions in the product ranges SIMODRIVE Sensor and Motion Connect 500.

## Technical specifications

| 6ES7 138-4DE02-0AB0                                    |                                               |
|--------------------------------------------------------|-----------------------------------------------|
| <b>Supply voltages</b>                                 |                                               |
| Load voltage L+                                        |                                               |
| • Rated value (DC)                                     | 24 V                                          |
| • permissible range, lower limit (DC)                  | 20.4 V                                        |
| • permissible range, upper limit (DC)                  | 28.8 V                                        |
| • Reverse polarity protection                          | Yes                                           |
| <b>Current consumption</b>                             |                                               |
| from load voltage L+ (without load), max.              | 45 mA                                         |
| from backplane bus 3.3 V DC, max.                      | 10 mA                                         |
| <b>Power losses</b>                                    |                                               |
| Power loss, typ.                                       | 2 W                                           |
| <b>Hardware configuration</b>                          |                                               |
| Module exchange                                        |                                               |
| • Hot swapping the IM-DP                               | Yes                                           |
| • Module exchange under process voltage                | Yes                                           |
| <b>Digital inputs</b>                                  |                                               |
| Number of digital inputs                               | 1                                             |
| Functions                                              | Gate control, synchronization, latch function |
| Input characteristic curve acc. to IEC 1131, Type 2    | Yes                                           |
| <b>Input voltage</b>                                   |                                               |
| • Rated value, DC                                      | 24 V                                          |
| • for signal "0"                                       | -30 to +5 V                                   |
| • for signal "1"                                       | 11 to 30 V                                    |
| <b>Input current</b>                                   |                                               |
| • for signal "0", max. (permissible quiescent current) | 2 mA                                          |
| • for signal "1", typ.                                 | 9 mA                                          |
| <b>Input delay (for rated value of input voltage)</b>  |                                               |
| • for standard inputs<br>- at "0" to "1", max.         | 2.5 µs                                        |
| <b>Cable length</b>                                    |                                               |
| • Cable length, shielded, max.                         | 50 m                                          |

| 6ES7 138-4DE02-0AB0                                     |                   |
|---------------------------------------------------------|-------------------|
| <b>Digital outputs</b>                                  |                   |
| Number of digital outputs                               | 2                 |
| Short-circuit protection                                | Yes               |
| • Response threshold, typ.                              | 2.6 A to 4 A      |
| Limitation of inductive shutdown voltage to             | L+ (-50 to -60 V) |
| Lamp load, max.                                         | 10 W              |
| Controlling a digital input                             | Yes               |
| <b>Output voltage</b>                                   |                   |
| • Rated value (DC)                                      | 24 V              |
| • for signal "0" (DC), max.                             | 3 V               |
| • for signal "1", min.                                  | L+ (-1 V)         |
| <b>Output current</b>                                   |                   |
| • for signal "1" rated value                            | 2 A               |
| • for signal "1" permissible range for 0 to 60 °C, min. | 5 mA              |
| • for signal "1" permissible range for 0 to 60 °C, max. | 2.4 A             |
| • for signal "0" residual current, max.                 | 0.5 mA            |
| <b>Output delay with resistive load</b>                 |                   |
| • 0 to "1", max.                                        | 100 µs            |
| <b>Switching frequency</b>                              |                   |
| • with resistive load, max.                             | 100 Hz            |
| • with inductive load, max.                             | 2 Hz              |
| • on lamp load, max.                                    | 10 Hz             |
| <b>Cable length</b>                                     |                   |
| • Cable length, shielded, max.                          | 1 000 m           |
| • Cable length unshielded, max.                         | 600 m             |
| <b>Encoder supply</b>                                   |                   |
| 24 V encoder supply                                     |                   |
| • 24 V                                                  | Yes; L+ (-0.8 V)  |
| • Short-circuit protection                              | Yes               |
| • Output current, max.                                  | 500 mA            |



# SIMATIC ET 200 distributed I/O

## ET 200S

### Technology modules

#### 1 COUNT 5 V/500 kHz counter module

#### Technical specifications (continued)

| 6ES7 138-4DE02-0AB0                                |                                         |
|----------------------------------------------------|-----------------------------------------|
| <b>Encoder</b>                                     |                                         |
| Number of connectable encoders, max.               | 1                                       |
| Connectable encoders                               |                                         |
| • Incremental encoder (symmetrical)                | Yes                                     |
| • 2-wire BEROs                                     | Yes                                     |
| Encoder signals, incremental encoder (symmetrical) |                                         |
| • Trace mark signals                               | A, notA, B, notB, A and B offset by 90° |
| • Zero mark signal                                 | N, notN                                 |
| • Input signal                                     | 5 V difference signal (phys. RS 422)    |
| • Input frequency, max.                            | 650 kHz                                 |
| • Cable length, shielded, max.                     | 50 m; > 500kHz: 30 m                    |
| <b>Counter</b>                                     |                                         |
| Number of counter inputs                           | 1; 32 bit                               |
| <b>Frequency measurement</b>                       |                                         |
| Measurement range, min.                            | 0.1 Hz                                  |
| Measurement range, max.                            | 500 kHz                                 |
| <b>Cycle duration measurement</b>                  |                                         |
| Measuring range, lower limit                       | 10 µs                                   |
| Measuring range, upper limit                       | 120 s                                   |
| <b>Speed measurement</b>                           |                                         |
| Measurement range, min. (lower limit)              | 1 1/min                                 |
| Measurement range, max. (upper limit)              | 25 000 1/min                            |
| <b>Parameter</b>                                   |                                         |
| Remark                                             | 16 byte                                 |

| 6ES7 138-4DE02-0AB0                            |                             |
|------------------------------------------------|-----------------------------|
| <b>Alarms/diagnostics/status information</b>   |                             |
| Diagnostics                                    |                             |
| • Diagnostic functions                         | Yes                         |
| Diagnostic indication LED                      |                             |
| • Group error SF (red)                         | Yes                         |
| • Status indicator digital output (green)      | Yes                         |
| • Status indicator digital input (green)       | Yes                         |
| • Status indicator backward counting (green)   | Yes                         |
| • Status indicator forward counting (green)    | Yes                         |
| • Synchronization SYN (green)                  | Yes                         |
| <b>Galvanic isolation</b>                      |                             |
| Galvanic isolation digital inputs              |                             |
| • Galvanic isolation digital inputs            | No; only opposite shielding |
| Galvanic isolation counter                     |                             |
| • between the channels and the backplane bus   | Yes                         |
| • between the channels and the load voltage L+ | No                          |
| <b>Dimensions and weight</b>                   |                             |
| Dimensions                                     |                             |
| • Width                                        | 30 mm                       |
| • Height                                       | 81 mm                       |
| • Depth                                        | 52 mm                       |
| Weight                                         |                             |
| • Weight, approx.                              | 65 g                        |

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#### Ordering data

| Order No.                                                                                     |                            |
|-----------------------------------------------------------------------------------------------|----------------------------|
| <b>1 COUNT 5 V/500 kHz counter module</b>                                                     | <b>6ES7 138-4DE02-0AB0</b> |
| For universal counting and measuring tasks with ET 200S                                       |                            |
| <b>Accessories</b>                                                                            |                            |
| <b>Label sheets DIN A4 (10 units)</b>                                                         |                            |
| Each sheet contains 60 label strips for I/O modules and 20 label strips for interface modules |                            |
| • petrol                                                                                      | <b>6ES7 193-4BH00-0AA0</b> |
| • red                                                                                         | <b>6ES7 193-4BD00-0AA0</b> |
| • yellow                                                                                      | <b>6ES7 193-4BB00-0AA0</b> |
| • light beige                                                                                 | <b>6ES7 193-4BA00-0AA0</b> |
| <b>Shield connection element</b>                                                              | <b>6ES7 193-4GA00-0AA0</b> |
| For TM-P and TM-E terminal modules, as fixing for busbars 3 x 10 mm, 5 units                  |                            |
| <b>Shield clamps</b>                                                                          | <b>6ES7 193-4GB00-0AA0</b> |
| For connecting braided cable shields to the busbar, 5 units                                   |                            |

#### Order No.

|                                                                               |                       |
|-------------------------------------------------------------------------------|-----------------------|
| <b>SIMODRIVE Incremental shaft encoder</b>                                    |                       |
| with RS 422 (TTL), operating voltage 10 to 30 V                               |                       |
| • With synchronous flange, universal axial/radial cable outlet with connector |                       |
| - 500 pulses/revolution                                                       | <b>6FX2 001-2DA50</b> |
| - 1000 pulses/revolution                                                      | <b>6FX2 001-2DB00</b> |
| - 1024 pulses/revolution                                                      | <b>6FX2 001-2DB02</b> |
| - 1250 pulses/revolution                                                      | <b>6FX2 001-2DB25</b> |
| - 1500 pulses/revolution                                                      | <b>6FX2 001-2DB50</b> |
| - 2000 pulses/revolution                                                      | <b>6FX2 001-2DC00</b> |
| - 2048 pulses/revolution                                                      | <b>6FX2 001-2DC04</b> |
| - 2500 pulses/revolution                                                      | <b>6FX2 001-2DC50</b> |
| - 3600 pulses/revolution                                                      | <b>6FX2 001-2DD60</b> |
| - 5000 pulses/revolution                                                      | <b>6FX2 001-2DF00</b> |
| • With synchronous flange, radial flange outlet                               |                       |
| - 500 pulses/revolution                                                       | <b>6FX2 001-2FA50</b> |
| - 1000 pulses/revolution                                                      | <b>6FX2 001-2FB00</b> |
| - 1024 pulses/revolution                                                      | <b>6FX2 001-2FB02</b> |
| - 1250 pulses/revolution                                                      | <b>6FX2 001-2FB25</b> |
| - 1500 pulses/revolution                                                      | <b>6FX2 001-2FB50</b> |
| - 2000 pulses/revolution                                                      | <b>6FX2 001-2FC00</b> |
| - 2048 pulses/revolution                                                      | <b>6FX2 001-2FC04</b> |
| - 2500 pulses/revolution                                                      | <b>6FX2 001-2FC50</b> |
| - 3600 pulses/revolution                                                      | <b>6FX2 001-2FD60</b> |
| - 5000 pulses/revolution                                                      | <b>6FX2 001-2FF00</b> |

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Order No.                                                                                                                                                                                                                                              |                                                                                                  | Order No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• With synchronous flange, axial flange outlet<ul style="list-style-type: none"><li>- 500 pulses/revolution</li><li>- 1000 pulses/revolution</li><li>- 1024 pulses/revolution</li><li>- 1250 pulses/revolution</li><li>- 1500 pulses/revolution</li><li>- 2000 pulses/revolution</li><li>- 2048 pulses/revolution</li><li>- 2500 pulses/revolution</li><li>- 3600 pulses/revolution</li><li>- 5000 pulses/revolution</li></ul></li><li>• With clamping flange, universal axial/radial cable outlet with connector<ul style="list-style-type: none"><li>- 500 pulses/revolution</li><li>- 1000 pulses/revolution</li><li>- 1024 pulses/revolution</li><li>- 1250 pulses/revolution</li><li>- 1500 pulses/revolution</li><li>- 2000 pulses/revolution</li><li>- 2048 pulses/revolution</li><li>- 2500 pulses/revolution</li><li>- 3600 pulses/revolution</li><li>- 5000 pulses/revolution</li></ul></li></ul> | <b>6FX2 001-2HA50</b><br><b>6FX2 001-2HB00</b><br><b>6FX2 001-2HB02</b><br><b>6FX2 001-2HB25</b><br><b>6FX2 001-2HB50</b><br><b>6FX2 001-2HC00</b><br><b>6FX2 001-2HC04</b><br><b>6FX2 001-2HC50</b><br><b>6FX2 001-2HD60</b><br><b>6FX2 001-2HF00</b> |                                                                                                  | <ul style="list-style-type: none"><li>• With clamping flange, radial flange outlet<ul style="list-style-type: none"><li>- 500 pulses/revolution</li><li>- 1000 pulses/revolution</li><li>- 1024 pulses/revolution</li><li>- 1250 pulses/revolution</li><li>- 1500 pulses/revolution</li><li>- 2000 pulses/revolution</li><li>- 2048 pulses/revolution</li><li>- 2500 pulses/revolution</li><li>- 3600 pulses/revolution</li><li>- 5000 pulses/revolution</li></ul></li><li>• With clamping flange, axial flange outlet<ul style="list-style-type: none"><li>- 500 pulses/revolution</li><li>- 1000 pulses/revolution</li><li>- 1024 pulses/revolution</li><li>- 1250 pulses/revolution</li><li>- 1500 pulses/revolution</li><li>- 2000 pulses/revolution</li><li>- 2048 pulses/revolution</li><li>- 2500 pulses/revolution</li><li>- 3600 pulses/revolution</li><li>- 5000 pulses/revolution</li></ul></li></ul> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>6FX2 001-2NA50</b><br><b>6FX2 001-2NB00</b><br><b>6FX2 001-2NB02</b><br><b>6FX2 001-2NB25</b><br><b>6FX2 001-2NB50</b><br><b>6FX2 001-2NC00</b><br><b>6FX2 001-2NC04</b><br><b>6FX2 001-2NC50</b><br><b>6FX2 001-2ND60</b><br><b>6FX2 001-2NF00</b> |                                                                                                  | <b>6FX2 001-2QA50</b><br><b>6FX2 001-2QB00</b><br><b>6FX2 001-2QB02</b><br><b>6FX2 001-2QB25</b><br><b>6FX2 001-2QB50</b><br><b>6FX2 001-2QC00</b><br><b>6FX2 001-2QC04</b><br><b>6FX2 001-2QC50</b><br><b>6FX2 001-2QD60</b><br><b>6FX2 001-2QF00</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                        | <b>Signal cable</b><br>Pre-assembled for HTL and TTL encoder, without Sub-D connector, UL/DESINA | <b>6FX5 002-2CA12-....</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



## SIMATIC ET 200 distributed I/O

## ET 200S

Technology modules  
1SI interface module

## Overview



- 1-channel module for serial data exchange through point-to-point connection
- For message frames max. 200 byte long
- RS 232C, RS 422, RS 485
- 2 versions
  - ASCII and 3964(R) protocol
  - Modbus and USS protocol
- Parameter assignment through GSD file or STEP 7 (V5.1 and higher)

## Technical specifications

|                                             | 6ES7 138-4DF01-0AB0                                                                                             | 6ES7 138-4DF11-0AB0                                                                                                            |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                      |                                                                                                                 |                                                                                                                                |
| Load voltage L+                             |                                                                                                                 |                                                                                                                                |
| • Rated value (DC)                          | 24 V                                                                                                            | 24 V                                                                                                                           |
| <b>Current consumption</b>                  |                                                                                                                 |                                                                                                                                |
| from backplane bus 24 V DC, max.            | 80 mA; typ. 20 mA                                                                                               | 80 mA                                                                                                                          |
| from backplane bus 3.3 V DC, max.           | 10 mA                                                                                                           | 10 mA                                                                                                                          |
| <b>Power losses</b>                         |                                                                                                                 |                                                                                                                                |
| Power loss, typ.                            | 1.2 W                                                                                                           | 1.2 W                                                                                                                          |
| <b>Memory</b>                               |                                                                                                                 |                                                                                                                                |
| Standard blocks                             | 5 100 byte; S_SEND 2700, S_RCV 2400, S_XON 2600, S_RTS 2600, S_V24 2700, S_VSTAT 1800, S_VSET 1800              | 11 100 byte; Modbus: S_SEND 2700, S_RCV 2400, S_MODB 6000; USI: S_SEND 2700, S_RCV 2400, S_USST 1900, S_USSR 2600, S_USSI 1500 |
| <b>Interfaces</b>                           |                                                                                                                 |                                                                                                                                |
| Number of interfaces                        | 1                                                                                                               | 1                                                                                                                              |
| RS 232C                                     | Yes; RS 232C signals: 8 (TxD, RxD, RTS, CTS, DTR, DSR, DCD, PE)                                                 | Yes; RS 232C signals: 8 (TxD, RxD, RTS, CTS, DTR, DSR, DCD, PE)                                                                |
| RS 422/RS485                                | Yes; RS-422 signals: 5 (TxD(A), RxD(A), TxD(B), RxD(B), PE); RS-485 signals: 3 (R/T(A), R/T(B), PE)             | Yes; RS-422 signals: 5 (TxD(A), RxD(A), TxD(B), RxD(B), PE); RS-485 signals: 3 (R/T(A), R/T(B), PE)                            |
| RS 232, cable length, shielded, max.        | 15 m                                                                                                            | 15 m                                                                                                                           |
| RS 422/485, cable length, shielded, max.    | 1 200 m                                                                                                         | 1 200 m                                                                                                                        |
| <b>Point-to-point</b>                       |                                                                                                                 |                                                                                                                                |
| Integrated protocol driver                  |                                                                                                                 |                                                                                                                                |
| • 3964 (R)                                  | Yes                                                                                                             |                                                                                                                                |
| • ASCII                                     | Yes                                                                                                             |                                                                                                                                |
| • MODBUS                                    |                                                                                                                 | Yes                                                                                                                            |
| • Transmission speed, Modbus protocol, max. |                                                                                                                 | 115.2 kbit/s; half duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s                |
| • USS                                       |                                                                                                                 | Yes                                                                                                                            |
| • Transmission speed, USS protocol, max.    |                                                                                                                 | 115.2 kbit/s; half duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s                |
| Transmission speed, RS 422/485              |                                                                                                                 |                                                                                                                                |
| • with 3964 (R) protocol, max.              | 115.2 kbit/s; half duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s |                                                                                                                                |
| • with ASCII protocol, max.                 | 115.2 kbit/s; full duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s |                                                                                                                                |

## Technical specifications (continued)

|                                                                                                                                                        | 6ES7 138-4DF01-0AB0                                                                                                                                                                                                                                                | 6ES7 138-4DF11-0AB0                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transmission speed, RS232<br>• with 3964 (R) protocol, max.<br><br>• with ASCII protocol, max.                                                         | 115.2 kbit/s; half duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s<br>115.2 kbit/s; full duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s                                 |                                                                                                                                                                                                                                                                    |
| Character frame (adjustable)<br>• Bits per character<br>• Number of start/stop bits<br>• Bits per character frame<br>• Parity                          | 7 or 8<br>1 or 2<br>10<br>none, odd, even, any                                                                                                                                                                                                                     | 8<br>1 or 2 (USS only 1)<br>10 or 11 (USS only 11 bit)<br>none, odd, even (USI even only)                                                                                                                                                                          |
| Number of byte per PLC sampling cycle<br>• Data quantity per PLC sampling cycle, receiving<br><br>• Data quantity per PLC sampling cycle, transmitting | 32 byte; with IM151-1 Standard as of 6ES7 151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7 151-1BA01-0AB0; otherwise 8 byte<br>32 byte; With IM151-1 Standard as of 6ES7 151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7 151-1BA01-0AB0; otherwise 8 byte | 32 byte; with IM151-1 Standard as of 6ES7 151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7 151-1BA01-0AB0; otherwise 8 byte<br>32 byte; With IM151-1 Standard as of 6ES7 151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7 151-1BA01-0AB0; otherwise 8 byte |
| <b>Alarms/diagnostics/status information</b>                                                                                                           |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| Diagnostic indication LED                                                                                                                              |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| • Receive RxD (green)                                                                                                                                  | Yes                                                                                                                                                                                                                                                                | Yes                                                                                                                                                                                                                                                                |
| • Group error SF (red)                                                                                                                                 | Yes                                                                                                                                                                                                                                                                | Yes                                                                                                                                                                                                                                                                |
| • Transmit TxD (green)                                                                                                                                 | Yes                                                                                                                                                                                                                                                                | Yes                                                                                                                                                                                                                                                                |
| <b>Galvanic isolation</b>                                                                                                                              |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| Electrical isolation interface                                                                                                                         |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| • between 422/485 and internal power supply                                                                                                            | Yes                                                                                                                                                                                                                                                                | Yes                                                                                                                                                                                                                                                                |
| • between RS 232 and internal power supply                                                                                                             | Yes                                                                                                                                                                                                                                                                | Yes                                                                                                                                                                                                                                                                |
| <b>Environmental requirements</b>                                                                                                                      |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| Operating temperature                                                                                                                                  |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| • Min.                                                                                                                                                 | 0 °C                                                                                                                                                                                                                                                               | 0 °C                                                                                                                                                                                                                                                               |
| • max.                                                                                                                                                 | 60 °C                                                                                                                                                                                                                                                              | 60 °C                                                                                                                                                                                                                                                              |
| Storage/transport temperature                                                                                                                          |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| • Min.                                                                                                                                                 | -40 °C                                                                                                                                                                                                                                                             | -40 °C                                                                                                                                                                                                                                                             |
| • max.                                                                                                                                                 | 70 °C                                                                                                                                                                                                                                                              | 70 °C                                                                                                                                                                                                                                                              |
| <b>Dimensions and weight</b>                                                                                                                           |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| Dimensions                                                                                                                                             |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| • Width                                                                                                                                                | 15 mm                                                                                                                                                                                                                                                              | 15 mm                                                                                                                                                                                                                                                              |
| • Height                                                                                                                                               | 81 mm                                                                                                                                                                                                                                                              | 81 mm                                                                                                                                                                                                                                                              |
| • Depth                                                                                                                                                | 52 mm                                                                                                                                                                                                                                                              | 52 mm                                                                                                                                                                                                                                                              |
| Weight                                                                                                                                                 |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                    |
| • Weight, approx.                                                                                                                                      | 50 g                                                                                                                                                                                                                                                               | 50 g                                                                                                                                                                                                                                                               |

## Ordering data

## Order No.

## 1SI interface module

- ASCII and 3964(R) protocols
- Modbus and USS protocols

6ES7 138-4DF01-0AB0  
6ES7 138-4DF11-0AB0

## Accessories

## TM-E15S 26-A1 terminal module

Ordering unit 5 units

6ES7 193-4CA40-0AA0

## TM-E15S 26-A1 terminal module

Ordering unit 5 units

6ES7 193-4CA50-0AA0

## Order No.

## TM-E15N24-A1 terminal module

Ordering unit 5 units

6ES7 193-4CA80-0AA0

## TM-E15S24-01 terminal module

Ordering unit 5 units

6ES7 193-4CB20-0AA0

## TM-E15C24-01 terminal module

Ordering unit 5 units

6ES7 193-4CB30-0AA0

## TM-E15N24-01 terminal module

Ordering unit 5 units

6ES7 193-4CB70-0AA0

## SIMATIC ET 200 distributed I/O

## ET 200S

Technology modules  
SIWAREX CS

## Overview



SIWAREX CS weighing electronics

SIWAREX CS is a versatile weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in all SIMATIC automation systems. Data can be accessed directly in the SIMATIC.

## Technical specifications

## SIWAREX CS

## Integration in automation systems

|                                                                         |                                                                                      |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| S7-400, S7-300, C7                                                      | Through ET 200S                                                                      |
| IM151-7 CPU                                                             | Through backplane bus                                                                |
| Automation systems from other manufacturers (possible with limitations) | Through ET 200S                                                                      |
| <b>Communication interfaces</b>                                         | SIMATIC S7 (ET 200S backplane bus), RS 232, TTY                                      |
| <b>Connection of remote displays (through TTY serial interface)</b>     | Display for weight value                                                             |
| <b>Adjustment of scales settings</b>                                    | Using SIMATIC S7/C7 IM151-7 CPU or SIWATOOL CS PC parameterization software (RS 232) |

## Measuring accuracy

|                                                               |                      |
|---------------------------------------------------------------|----------------------|
| Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K | 0.05 %               |
| Internal resolution                                           | 65535                |
| Data format of weight values                                  | 2 byte (fixed-point) |

## Number of measurements/second

50

## Digital filter

0.05 ... 5 Hz (in 7 steps), mean-value filter

## Weighing functions

|                       |               |
|-----------------------|---------------|
| Weight values         | Gross, net    |
| Limit values          | 2 (min./max.) |
| Zero setting function | Per command   |
| Tare function         | Per command   |
| Tare specification    | Per command   |

## Load cells

Strain gages in 4-wire or 6-wire system

## SIWAREX CS

## Load cell powering

|                                    |                               |
|------------------------------------|-------------------------------|
| Supply voltage $U_s$ (rated value) | 6 V DC typical                |
| Max. supply current                | ≤ 68 mA                       |
| Permissible load impedance         |                               |
| • $R_{Lmin}$                       | > 87 Ω                        |
| • $R_{Lmax}$                       | < 4010 Ω                      |
|                                    | With SIWAREX IS Ex interface: |
| • $R_{Lmin}$                       | > 87 Ω                        |
| • $R_{Lmax}$                       | < 4010 Ω                      |

## Load cell characteristic

1 mV/V ... 4 mV/V

## Permissible range of measuring signal (at greatest set characteristic value)

-2.4 ... +26.4 mV

## Max. distance of load cells

1 000 m

## Intrinsically-safe load cell powering

Optional (SIWAREX IS Ex interface)

## External load cell powering

Possible up to 24 V

## Connection to load cells in Ex zone 1

Optionally via SIWAREX IS Ex interface

## Ex approvals zone 2 and safety

ATEX 95, FM, cUL<sub>US</sub> Haz. Loc.

## Supply voltage 24 V DC

|                                                       |         |
|-------------------------------------------------------|---------|
| Rated voltage                                         | 24 V DC |
| Max. current consumption                              | 150 mA  |
| <b>IP degree of protection to EN 60529; IEC 60529</b> | IP20    |

## Climatic requirements

 $T_{min}$  (IND) to  $T_{max}$  (IND) (operating temperature)

|                         |                |
|-------------------------|----------------|
| Vertical installation   | -10 ... +60 °C |
| Horizontal installation | -10 ... +40 °C |

## EMC requirements according to

EN 61326, EN 45501  
NAMUR NE21, Part 1

## Dimensions

80 x 125 x 130 mm

## Ordering data

## Order No.

## SIWAREX CS

Weighing electronics for scales in SIMATIC ET 200S

7MH4 910-0AA01

## SIWAREX CS Manual

available in a range of languages  
Free download on the Internet at:  
[www.siemens.com/weighing-technology](http://www.siemens.com/weighing-technology)

## SIWAREX CS "Getting started"

Sample software shows beginners how to program the scales in STEP 7.  
Free download on the Internet at:  
[www.siemens.com/weighing-technology](http://www.siemens.com/weighing-technology)

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Order No.                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Order No.                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| <b>Configuration package<br/>SIWAREX CS on CD-ROM for<br/>SIMATIC S7, version V5.4 or<br/>higher</b> <ul style="list-style-type: none"><li>• Software for SIWATOOL CS<br/>scale adjustment<br/>(in a range of languages)</li><li>• Manuals available on CD<br/>(in a range of languages)</li><li>• SIWAREX CS "Getting started"</li></ul>                                                                                                                                         | <b>7MH4 910-0AK01</b>                        | <b>SIWAREX JB junction box,<br/>stainless steel housing</b><br><br>for connecting up to 4 load cells<br>in parallel                                                                                                                                                                                                                                                                                                                                             | <b>7MH4 710-1EA</b>                            |
| <b>SIWATOOL connection cable</b><br>from SIWAREX U/CS with serial<br>PC interface, for 9-pin PC inter-<br>faces (RS 232), 3 m long                                                                                                                                                                                                                                                                                                                                                | <b>7MH4 607-8CA</b>                          | <b>Ex interface, type SIWAREX Pi</b><br><br>With UL and FM approvals, but<br><b>without ATEX approval</b><br>for intrinsically-safe connection of<br>load cells,<br>suitable for the SIWAREX U, CS,<br>MS, FTA, FTC and M weighing<br>modules.<br>Not approved for use in the EU.                                                                                                                                                                               | <b>7MH4 710-5AA</b>                            |
| <b>Installation material<br/>(mandatory)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                              | <b>Manual for Ex interface type<br/>SIWAREX Pi</b>                                                                                                                                                                                                                                                                                                                                                                                                              | <b>C71000-T5974-C29</b>                        |
| <b>Terminal module</b><br><br>TM-E 30 mm wide (required for<br>each SIWAREX module)                                                                                                                                                                                                                                                                                                                                                                                               | <b>6ES7 193-4CG20-0AA0<br/>or compatible</b> | <b>Ex interface, type SIWAREX IS</b><br><br>With ATEX approval, but <b>without<br/>UL and FM approvals</b><br>for intrinsically-safe connection of<br>load cells,<br>including manual,<br>suitable for the SIWAREX U, CS,<br>MS, FTA, FTC, M and CF<br>weighing modules.<br>Approved for use in the EU. <ul style="list-style-type: none"><li>• With short-circuit current<br/>&lt; 199 mA DC</li><li>• With short-circuit current<br/>&lt; 137 mA DC</li></ul> | <b>7MH4 710-5BA</b><br><br><b>7MH4 710-5CA</b> |
| <b>Shield contact element</b><br><br>Contents 5 units, sufficient for<br>5 cables                                                                                                                                                                                                                                                                                                                                                                                                 | <b>6ES7 193-4GA00-0AA0</b>                   | <b>Cable (optional)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                |
| <b>Shield connection terminal</b><br><br>Contents: 5 units, sufficient for<br>5 cables<br><br>Note: one shield connection<br>terminal is required each for the <ul style="list-style-type: none"><li>• scales connection and</li><li>• TTY interface or</li><li>• RS 232 interface</li></ul>                                                                                                                                                                                      | <b>6ES7 193-4GB00-0AA0</b>                   | <b>Cable Li2Y 1 x 2 x 0.75 ST +<br/>2 x (2 x 0.34 ST) - CY,<br/>orange sheath</b><br><br>to connect SIWAREX U, CS, MS,<br>FTA, FTC, M and CF to the<br>junction box (JB), extension box<br>(EB) or Ex interface (Ex-I) or<br>between two JB's, for fixed laying,<br>occasional bending permitted,<br>10.8 mm outer diameter, for<br>ambient temperature<br>-40 ... +80 °C                                                                                       | <b>7MH4 702-8AG</b>                            |
| <b>N busbar, galvanized</b><br><br>3 x 10 mm, 1.0 m long                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>8WA2 842</b>                              | <b>Cable Li2Y 1 x 2 x 0.75 ST +<br/>2 x (2 x 0.34 ST) - CY,<br/>blue sheath</b><br><br>to connect the junction box (JB)<br>or extension box (EB) in a poten-<br>tially explosive atmosphere to the<br>Ex interface (Ex-I), for fixed<br>laying, occasional bending<br>permitted, blue PVC insulating<br>sheath, approx. 10.8 mm outer<br>diameter, for ambient temperature<br>-40 ... +80 °C                                                                    | <b>7MH4 702-8AF</b>                            |
| <b>Feeder terminal for N busbar</b>                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>8WA2 868</b>                              | <b>Cable LiYCY 4 x 2 x 0.25 mm²</b>                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>7MH4 407-8BD0</b>                           |
| <b>Remote displays (option)</b><br><br>The digital remote displays can<br>be connected directly to the<br>SIWAREX CS through the TTY<br>interface.<br><br><u>The following remote display can<br/>be used:</u><br>S102<br><br>Siebert Industrieelektronik GmbH<br>P.O. Box 1180<br>D-66565 Eppelborn<br>Tel.: +49 6806/980-0<br>Fax: +49 6806/980-999<br>Internet: <a href="http://www.siebert.de">www.siebert.de</a><br><br>Detailed information available<br>from manufacturer. |                                              | for TTY (connect 2 pairs of<br>conductors in parallel), for<br>connection of a remote display                                                                                                                                                                                                                                                                                                                                                                   |                                                |
| <b>Accessories</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                |
| <b>SIWAREX JB junction box,<br/>aluminium housing</b><br><br>for connecting up to 4 load cells<br>in parallel, and for connecting<br>several junction boxes                                                                                                                                                                                                                                                                                                                       | <b>7MH4 710-1BA</b>                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                |

I: Subject to export regulations AL: N and ECCN: EAR99H

## SIMATIC ET 200 distributed I/O

## ET 200S

Technology modules  
SIWAREX CF

## Overview



SIWAREX CF is a transmitter for connecting strain-gauge sensors for tasks such as measuring force and torque. The compact module is easy to install in all SIMATIC automation systems. Complete data access to the current measured values is then possible via the SIMATIC.

## Technical specifications

| SIWAREX CF                                                    |                                                                                           |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Integration in automation systems</b>                      |                                                                                           |
| S7-400, S7-300, C7                                            | Through ET 200S                                                                           |
| Automation systems from other vendors                         | Possible through ET 200S with IM 151-1                                                    |
| <b>Communication interfaces</b>                               | SIMATIC S7 (ET 200S backplane bus), 8 byte, I/O area                                      |
| <b>Module parameterization</b>                                | Not required (module is pre-parameterized)                                                |
| <b>Measuring properties</b>                                   |                                                                                           |
| Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K | ≤ 0.15 %                                                                                  |
| Signal resolution                                             | 14 bit plus 1 bit sign                                                                    |
| <b>Number of measurements/second</b>                          | 50                                                                                        |
| <b>Low-pass filter</b>                                        | Without or 2 Hz                                                                           |
| <b>Sensors</b>                                                | In accordance with the principle of expansion measurement (full bridge) 4-wire connection |
| <b>Sensor feed</b>                                            |                                                                                           |
| Supply voltage, short-circuit-proof                           | 6 V DC ± 5 %                                                                              |
| Permissible sensor resistance                                 |                                                                                           |
| • $R_{Lmin}$                                                  | > 250 Ω                                                                                   |
| • $R_{Lmax}$                                                  | < 4010 Ω                                                                                  |

| SIWAREX CF                                                                                 |                                        |
|--------------------------------------------------------------------------------------------|----------------------------------------|
| <b>Permissible sensor cell coefficient</b>                                                 | Up to 4 mV/V                           |
| <b>Permissible range of the measuring signal</b>                                           | -25.2 ... +25.2 mV                     |
| <b>Power Supply</b>                                                                        |                                        |
| Rated voltage                                                                              | 24 V DC                                |
| Max. current consumption                                                                   | 150 mA                                 |
| Current consumption from backplane bus                                                     | Typ. 10 mA                             |
| <b>Connection to sensors in Ex zone 1</b>                                                  | Optionally via SIWAREX IS Ex interface |
| <b>Ex approval zone 2 and safety</b>                                                       | ATEX 95, cUL <sub>US</sub> Haz. Loc.   |
| <b>IP degree of protection to EN 60529; IEC 60529</b>                                      | IP20                                   |
| <b>Climatic requirements</b><br>$T_{min}$ (IND) to $T_{max}$ (IND) (operating temperature) |                                        |
| Vertical installation                                                                      | 0 ... +60 °C                           |
| Horizontal installation                                                                    | 0 ... +40 °C                           |
| <b>EMC requirements according to</b>                                                       | NAMUR NE21, Part 1 89/386/EEC          |
| <b>Dimensions</b>                                                                          | 30 x 80 x 50 mm                        |

| Ordering data                                                                                                                                                                                                                              | Order No.                                |                                                                                                                                                                                                                                                                                                                                                               | Order No.                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| <b>SIWAREX CF</b><br>Weighing module for strain-gauge sensors in SIMATIC ET 200S<br>(SIWAREX CF configuring package not required)                                                                                                          | <b>7MH4 920-0AA01</b>                    | <b>N busbar, galvanized</b><br>3 x 10 mm, 1.5 m long                                                                                                                                                                                                                                                                                                          | <b>8WA2 842</b>                                |
| <b>SIWAREX CF manual</b><br>• German, English<br>Free download on the Internet at:<br><a href="http://www.siemens.com/weighing-technology">www.siemens.com/weighing-technology</a>                                                         |                                          | <b>Feeder terminal for N busbar</b>                                                                                                                                                                                                                                                                                                                           | <b>8WA2 868</b>                                |
| <b>SIWAREX CF "Getting started"</b><br>Sample software for easy acquaintance with programming in STEP 7. Free download on the Internet at:<br><a href="http://www.siemens.com/weighing-technology">www.siemens.com/weighing-technology</a> |                                          | <b>Accessories</b>                                                                                                                                                                                                                                                                                                                                            |                                                |
| <b>Installation material (mandatory)</b>                                                                                                                                                                                                   |                                          | <b>SIWAREX EB extension box</b><br>for extending sensor cables                                                                                                                                                                                                                                                                                                | <b>7MH4 710-2AA</b>                            |
| <b>Terminal module</b><br>TM-E 30 mm wide (required for each SIWAREX module)                                                                                                                                                               | <b>6ES7 193-4CG20-0AA0 or compatible</b> | <b>SIWAREX IS Ex interface</b><br>With ATEX approval, but <b>without UL and FM approvals</b> , for intrinsically-safe connection of load cells, including Manual, suitable for the SIWAREX U, CS, MS, FTA, FTC and M weighing modules.<br>Approved for use in the EU.<br>• With short-circuit current < 199 mA DC<br>• With short-circuit current < 137 mA DC | <b>7MH4 710-5BA</b><br><br><b>7MH4 710-5CA</b> |
| <b>Shield contact element</b><br>Contents 5 units, sufficient for 5 cables                                                                                                                                                                 | <b>6ES7 193-4GA00-0AA0</b>               | <b>Cable (optional)</b>                                                                                                                                                                                                                                                                                                                                       |                                                |
| <b>Shield connection terminal</b><br>Content: 5 units, sufficient for 5 cables<br>One shield terminal element is required per sensor cable                                                                                                 | <b>6ES7 193-4GB00-0AA0</b>               | <b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath</b><br>to connect SIWAREX U, CS, MS, FTA, FTC, M and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JB's, for fixed laying, occasional bending permitted, 10.8 mm outer diameter, for ambient temperature -40 ... +80 °C                         | <b>7MH4 702-8AG</b>                            |

# SIMATIC ET 200 distributed I/O

## ET 200S

### I/O modules

#### Terminal modules for power and electr. modules

#### Overview



- Mechanical modules as receptacles for the electronic modules
- For setting up permanent wiring via build-as-you-go voltage buses
- Keyed connection technology to ensure an enhanced vibration resistance of up to 5 g
- Different versions for accepting power modules and electronic modules
- Replaceable terminal box (even within the station network)
- Automatic coding of the electronic modules
- Build-as-you-go shielding of the backplane bus for high data security
- Color coding facility for the terminals and for identifying the slot numbers
- Alternatively available with screw-type or spring-loaded terminals as well as with no-strip fast connection system "FastConnect" for up to 60 % faster process wiring

| Ordering data                                                                                                                                         | Order No.                  | Order No.                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TM-P terminal modules for PM-E power modules</b>                                                                                                   |                            |                                                                                                                                                                         |
| <b>TM-P15S23-A1</b><br>Ordering unit 1 unit<br>2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals    | <b>6ES7 193-4CC20-0AA0</b> |                                                                                                                                                                         |
| <b>TM-P15C23-A1</b><br>Ordering unit 1 unit<br>2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals | <b>6ES7 193-4CC30-0AA0</b> |                                                                                                                                                                         |
| <b>TM-P15N23-A1</b><br>Ordering unit 1 unit<br>2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect             | <b>6ES7 193-4CC70-0AA0</b> |                                                                                                                                                                         |
| <b>TM-P15S23-A0</b><br>Ordering unit 1 unit<br>2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals       | <b>6ES7 193-4CD20-0AA0</b> |                                                                                                                                                                         |
| <b>TM-P15C23-A0</b><br>Ordering unit 1 unit<br>2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals    | <b>6ES7 193-4CD30-0AA0</b> |                                                                                                                                                                         |
| <b>TM-P15N23-A0</b><br>Ordering unit 1 unit<br>2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, FastConnect                | <b>6ES7 193-4CD70-0AA0</b> |                                                                                                                                                                         |
| <b>TM-P15S22-01</b><br>Ordering unit 1 unit<br>2 x 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals | <b>6ES7 193-4CE00-0AA0</b> |                                                                                                                                                                         |
|                                                                                                                                                       |                            | <b>TM-P15C22-01</b><br>Ordering unit 1 unit<br>2 x 2 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals                   |
|                                                                                                                                                       |                            | <b>TM-P15N22-01</b><br>Ordering unit 1 unit<br>2 x 2 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect                               |
|                                                                                                                                                       |                            | <b>TM-P30S44-A0</b><br>Ordering unit 1 unit<br>7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals for PM-E F PROFIsafe    |
|                                                                                                                                                       |                            | <b>TM-P30C44-A0</b><br>Ordering unit 1 unit<br>7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals for PM-E F PROFIsafe |
|                                                                                                                                                       |                            | <b>TM-E terminal module for electronic modules<sup>1)</sup></b>                                                                                                         |
|                                                                                                                                                       |                            | <b>TM-E15S24-A1</b><br>Ordering unit 5 units<br>2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals                     |
|                                                                                                                                                       |                            | <b>TM-E15C24-A1</b><br>Ordering unit 5 units<br>2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals                  |
|                                                                                                                                                       |                            | <b>TM-E15S24-01</b><br>Ordering unit 5 units<br>2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals                     |

<sup>1)</sup> Observe project planning help for selecting the suitable TM-E and TM-P



| Ordering data                                                                                                                                          | Order No.                  |                                                                                                                                                                                                            | Order No.                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TM-E15C24-01</b><br>Ordering unit 5 units<br>2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals | <b>6ES7 193-4CB30-0AA0</b> | <b>TM-E30S46-A1</b><br>Ordering unit 1 unit<br>4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals                                                         | <b>6ES7 193-4CF40-0AA0</b>                                                                                                                                                                                     |
| <b>TM-E15S23-01</b><br>Ordering unit 5 units<br>2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals    | <b>6ES7 193-4CB00-0AA0</b> | <b>TM-E30C46-A1</b><br>Ordering unit 1 unit<br>4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals                                                      | <b>6ES7 193-4CF50-0AA0</b>                                                                                                                                                                                     |
| <b>TM-E15C23-01</b><br>Ordering unit 5 units<br>2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals | <b>6ES7 193-4CB10-0AA0</b> | <b>TM-E15S24-AT</b><br>Ordering unit 1 unit<br>for internal temperature compensation with 2 AI TC High Feature, screw-type terminal                                                                        | <b>6ES7 193-4CL20-0AA0</b>                                                                                                                                                                                     |
| <b>TM-E15N23-01</b><br>Ordering unit 5 units<br>2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect             | <b>6ES7 193-4CB60-0AA0</b> | <b>TM-E15C24-AT</b><br>Ordering unit 1 unit<br>for internal temperature compensation with 2 AI TC High Feature, spring-loaded terminals                                                                    | <b>6ES7 193-4CL30-0AA0</b>                                                                                                                                                                                     |
| <b>TM-E15N24-01</b><br>Ordering unit 5 units<br>2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect             | <b>6ES7 193-4CB70-0AA0</b> | <b>Accessories for shield connection</b>                                                                                                                                                                   |                                                                                                                                                                                                                |
| <b>TM-E15S26-A1</b><br>Ordering unit 5 units<br>2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals    | <b>6ES7 193-4CA40-0AA0</b> | <b>Shield connection element</b><br>Ordering unit 5 units<br>For plugging into TM-E and TM-P                                                                                                               | <b>6ES7 193-4GA00-0AA0</b>                                                                                                                                                                                     |
| <b>TM-E15C26-A1</b><br>Ordering unit 5 units<br>2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals | <b>6ES7 193-4CA50-0AA0</b> | <b>Shield clamps</b><br>Ordering unit 5 units<br>For busbar 3 × 10 mm                                                                                                                                      | <b>6ES7 193-4GB00-0AA0</b>                                                                                                                                                                                     |
| <b>TM-E15N24-A1</b><br>Ordering unit 5 units<br>2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect             | <b>6ES7 193-4CA70-0AA0</b> | <b>Grounding terminal</b><br>Ordering unit 1 unit<br>for cable cross-sections up to 25 mm <sup>2</sup>                                                                                                     | <b>8WA2 868</b>                                                                                                                                                                                                |
| <b>TM-E15N26-A1</b><br>Ordering unit 5 units<br>2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect             | <b>6ES7 193-4CA80-0AA0</b> | <b>3 × 10 mm busbars</b><br>Ordering unit 1 unit                                                                                                                                                           | <b>8WA2 842</b>                                                                                                                                                                                                |
| <b>TM-E30S44-01</b><br>Ordering unit 1 unit<br>4 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals     | <b>6ES7 193-4CG20-0AA0</b> | <b>Accessories for coding</b>                                                                                                                                                                              |                                                                                                                                                                                                                |
| <b>TM-E30C44-01</b><br>Ordering unit 1 unit<br>4 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals  | <b>6ES7 193-4CG30-0AA0</b> | <b>Color coding plates</b><br>Ordering unit 200 units for TM-P, TM-E<br>• white<br>• yellow<br>• yellow/green<br>• red<br>• blue<br>• brown<br>• turquoise                                                 | <b>6ES7 193-4LA20-0AA0</b><br><b>6ES7 193-4LB20-0AA0</b><br><b>6ES7 193-4LC20-0AA0</b><br><b>6ES7 193-4LD20-0AA0</b><br><b>6ES7 193-4LF20-0AA0</b><br><b>6ES7 193-4LG20-0AA0</b><br><b>6ES7 193-4LH20-0AA0</b> |
|                                                                                                                                                        |                            | <b>Labels, inscribed</b><br>Ordering unit 1 unit<br>200 units for slot numbering (1 to 20) 10 x<br>200 units for slot numbering (1 to 40) 5 x<br>200 units for slot numbering (1 to 64) 1 x, (1 to 68) 2 x | <b>8WA8 861-0AB</b><br><b>8WA8 861-0AC</b><br><b>8WA8 861-0DA</b>                                                                                                                                              |
|                                                                                                                                                        |                            | <b>Labels, blank</b><br>200 units for slot numbering                                                                                                                                                       | <b>8WA8 848-2AY</b>                                                                                                                                                                                            |



# SIMATIC ET 200 distributed I/O

## ET 200S

### I/O modules

#### 4 IQ-Sense and 8 IQ-Sense sensor modules

### Overview



- The 4 IQ-Sense sensor module is an intelligent 4-channel electronic module for the ET 200S distributed I/O in PROFIBUS DP networking systems. It is used to connect photoelectric sensors using IQ-Sense technology.
- The 8×IQ-Sense sensor module is an intelligent 8-channel I/O module for SIMATIC S7-300 and ET 200M and is used to connect photoelectric and ultrasonic sensors using IQ-Sense technology. It is possible to combine different types of sensors on one module.

Standard function blocks are available for simplified handling of a SIMATIC S7. Conventional sensors cannot be operated on these modules.

The main applications of the IQ-Sense system are found in installations and machines:

- With high availability demands
- With a high probability of interaction between sensors
- With the need for high flexibility and dynamic changing of sensor parameters.

### Technical specifications

| 6ES7 138-4GA00-0AB0                       |                                                |
|-------------------------------------------|------------------------------------------------|
| <b>Supply voltages</b>                    |                                                |
| Load voltage L+                           |                                                |
| • Rated value (DC)                        | 24 V; from power module                        |
| • Reverse polarity protection             | Yes                                            |
| <b>Current consumption</b>                |                                                |
| from load voltage L+ (without load), max. | 300 mA                                         |
| <b>Power losses</b>                       |                                                |
| Power loss, typ.                          | 0.85 W                                         |
| <b>Digital inputs</b>                     |                                                |
| Number of digital inputs                  | 4                                              |
| Cable length                              |                                                |
| • Cable length, shielded, max.            | 50 m                                           |
| • Cable length unshielded, max.           | 50 m                                           |
| <b>Analog inputs</b>                      |                                                |
| Cycle time (all channels) max.            | 3.24 ms                                        |
| <b>Encoder</b>                            |                                                |
| Connectable encoders                      |                                                |
| • Description                             | Photoelectric proximity switches with IQ-SENSE |

| 6ES7 138-4GA00-0AB0                          |                                      |
|----------------------------------------------|--------------------------------------|
| <b>Alarms/diagnostics/status information</b> |                                      |
| Diagnostics                                  |                                      |
| • Diagnostic functions                       | Yes; Diagnostic information readable |
| Diagnostic indication LED                    |                                      |
| • Group error SF (red)                       | Yes                                  |
| • Status indicator sensor channel (green)    | Yes                                  |
| <b>Isolation</b>                             |                                      |
| Isolation checked with                       | 500 V DC                             |
| <b>Galvanic isolation</b>                    |                                      |
| Galvanic isolation digital inputs            |                                      |
| • between the channels                       | No                                   |
| • between the channels and the backplane bus | Yes                                  |
| <b>Permissible potential difference</b>      |                                      |
| between different circuits                   | 75 V DC / 60 V AC                    |
| <b>Dimensions and weight</b>                 |                                      |
| Dimensions                                   |                                      |
| • Width                                      | 15 mm                                |
| • Height                                     | 81 mm                                |
| • Depth                                      | 52 mm                                |
| Weight                                       |                                      |
| • Weight, approx.                            | 35 g                                 |

**Technical specifications** (continued)

| 6ES7 338-7XF00-0AB0                          |                                                                                                |
|----------------------------------------------|------------------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                       |                                                                                                |
| Load voltage L+                              |                                                                                                |
| • Rated value (DC)                           | 24 V                                                                                           |
| <b>Current consumption</b>                   |                                                                                                |
| from load voltage L+ (without load), max.    | 1 A                                                                                            |
| from backplane bus 5 V DC, max.              | 150 mA; typically                                                                              |
| <b>Connection method</b>                     |                                                                                                |
| required front connector                     | 20-pin                                                                                         |
| <b>Digital inputs</b>                        |                                                                                                |
| Number of digital inputs                     | 8                                                                                              |
| Cable length                                 |                                                                                                |
| • Cable length unshielded, max.              | 50 m                                                                                           |
| <b>Encoder</b>                               |                                                                                                |
| Connectable encoders                         |                                                                                                |
| • Description                                | photoelectric proximity switches and ultrasonic sensors with IQ-Sense, cycle time 2.88 to 6 ms |
| <b>Alarms/diagnostics/status information</b> |                                                                                                |
| Diagnostic indication LED                    |                                                                                                |
| • Status indicator digital input (green)     | Yes                                                                                            |
| <b>Isolation</b>                             |                                                                                                |
| Isolation checked with                       | 500 V DC                                                                                       |
| <b>Galvanic isolation</b>                    |                                                                                                |
| Galvanic isolation digital inputs            |                                                                                                |
| • between the channels                       | No                                                                                             |
| • between the channels and the backplane bus | Yes                                                                                            |
| <b>Dimensions and weight</b>                 |                                                                                                |
| Dimensions and weight                        |                                                                                                |
| • Width                                      | 40 mm                                                                                          |
| • Height                                     | 125 mm                                                                                         |
| • Depth                                      | 120 mm                                                                                         |
| Weight                                       |                                                                                                |
| • Weight, approx.                            | 250 g                                                                                          |

**Ordering data****Order No.****4 IQ-Sense sensor module****6ES7 138-4GA00-0AB0****8 x IQ-Sense sensor module****6ES7 338-7XF00-0AB0****Sensors**

Note:

Sensors for connection to the sensor module are the C40 IQ-Sense diffuse sensors, the K80 IQ-Sense retroreflective sensors and the M18 IQ-Sense ultrasonic sensors.

Since July 01, 2010 the marketing and sale of these sensors has been transferred to Pepperl+Fuchs:

Pepperl+Fuchs Vertrieb  
Deutschland GmbH  
Lilienthalstraße 200  
68307 Mannheim  
Germany

E-mail: [fa-info@de.pepperl-fuchs.com](mailto:fa-info@de.pepperl-fuchs.com)

# SIMATIC ET 200 distributed I/O

## ET 200S

SIPLUS I/O modules  
SIPLUS power modules for PM-E electr. modules

### Overview



- For monitoring and, depending on the version, fusing the load and sensor supply voltage
- Can be plugged onto TM-P terminal modules with automatic coding
- Diagnostic message for voltage and blown fuse (can be switched off via configuration)
- Fail-safe PM-E F PROFIsafe power module for safe switching off of sequentially plugged-in 24 V DC to 10 A digital output modules or external loads; 3 additional integrated fail-safe 24 V DC / 2 A outputs
- PM-E 24 V to 48 V DC
  - with status information and diagnostics "Load voltage present"
  - for option handling
- PM-E 24 V DC to 230 V AC
  - power module for universal use
  - for option handling

#### Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

| PM-E 24 V DC power module |                                                                               |
|---------------------------|-------------------------------------------------------------------------------|
| Order No.                 | <b>6AG1 138-4CA01-2AA0</b>                                                    |
| Order No. based on        | <b>6ES7 138-4CA01-0AA0</b>                                                    |
| Ambient temperature range | -25 ... +60 °C                                                                |
| Ambient conditions        | Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere). |
| Technical specifications  | The technical data is identical to that of the based on modules.              |

| 24 to 48 V DC PM-E power module |                                                                               |
|---------------------------------|-------------------------------------------------------------------------------|
| Order No.                       | <b>6AG1 138-4CA50-2AB0</b>                                                    |
| Order No. based on              | <b>6ES7 138-4CA50-0AB0</b>                                                    |
| Ambient temperature range       | -25 ... +60 °C                                                                |
| Ambient conditions              | Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere). |
| Technical data                  | The technical data is identical to that of the based on modules.              |

| PM-E power module 24 to 48 V DC / 42 to 230 V AC |                                                                               |
|--------------------------------------------------|-------------------------------------------------------------------------------|
| Order No.                                        | <b>6AG1 138-4CB11-2AB0</b>                                                    |
| Order No. based on                               | <b>6ES7 138-4CB11-0AB0</b>                                                    |
| Ambient temperature range                        | -25 ... +60 °C                                                                |
| Ambient conditions                               | Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere). |
| Technical data                                   | The technical data is identical to that of the based on modules.              |

| Ambient conditions                                                           |                                                                                                                                                                                                |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relative humidity                                                            | 5 ... 100 %<br>Condensation permissible                                                                                                                                                        |
| Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                                  |
| Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                                          |
| Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                                          |
| Air pressure (depending on the highest positive temperature range specified) | 1080 ... 795 hPa<br>(-1000 ... +2000 m)<br>see ambient temperature range<br>795 ... 658 hPa<br>(+2000 ... +3500 m)<br>derating 10 K<br>658 ... 540 hPa<br>(+3500 ... +5000 m)<br>derating 20 K |

<sup>1)</sup> ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm; H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O<sub>3</sub> < 0.1 ppm; NOX < 5.2 ppm  
Limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O<sub>3</sub> < 1.0 ppm; NOX < 10.4 ppm

<sup>2)</sup> The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:  
[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

# SIMATIC ET 200 distributed I/O

## ET 200S

SIPLUS I/O modules  
SIPLUS power modules for PM-E electr. modules

| Ordering data                                                                       | Order No.                  | Order No.                                                                                                                                |
|-------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PM-E power module SIPLUS</b><br>(extended temperature range and medial exposure) |                            |                                                                                                                                          |
| <b>PM-E 24 V DC power module <sup>1)</sup></b> H                                    | <b>6AG1 138-4CA01-2AA0</b> | <b>PM-E power module 24 to 48 V DC, 24 to 230 V AC</b> H <b>6AG1 138-4CB11-2AB0</b><br>For electronic modules; with diagnostics and fuse |
| For electronic modules; with diagnostics                                            |                            | <b>Accessories</b><br>siehe SIMATIC PM-E power modules, <b>page 9/57</b>                                                                 |
| <b>24 to 48 V DC PM-E power module</b> H                                            | <b>6AG1 138-4CA50-2AB0</b> |                                                                                                                                          |
| For electronic modules; with diagnostics; with status bit "load voltage" present    |                            |                                                                                                                                          |

<sup>1)</sup> Can be used for all electronic and technology modules except  
2 DI 120 V AC / 2 DI 230 V AC / 2 DO 120/230 V AC

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

### Selection tool for terminal modules

| Power modules                           | TM-P terminal modules for power modules |              |              |              |
|-----------------------------------------|-----------------------------------------|--------------|--------------|--------------|
| Screw-type terminal type designation    | TM-P15S23-A1                            | TM-P15S23-A0 | TM-P15S22-01 | TM-P30S44-A0 |
| Order number 6ES7 193...                | 4CC20-0AA0                              | 4CD20-0AA0   | 4CE00-0AA0   | 4CK20-0AA0   |
| Spring-loaded terminal type designation | TM-P15C23-A1                            | TM-P15C23-A0 | TM-P15C22-01 | TM-P30C44-A0 |
| Order number 6ES7 193...                | 4CC30-0AA0                              | 4CD30-0AA0   | 4CE10-0AA0   | 4CK30-0AA0   |
| FastConnect type designation            | TM-P15N23-A1                            | TM-P15N23-A0 | TM-P15N22-01 | Soon to come |
| Order number 6ES7 193...                | 4CC70-0AA0                              | 4CD70-0AA0   | 4CE60-0AA0   |              |
| PM-E 24 V DC                            | •                                       | •            | •            |              |
| PM-E 24 to 48 V DC                      | •                                       | •            | •            |              |
| PM-E 24 V DC/120/230 V AC               | •                                       | •            | •            |              |
| PM-E F 24 V DC PROFI-safe               |                                         |              |              | •            |

## SIMATIC ET 200 distributed I/O

## ET 200S

## SIPLUS I/O modules

## SIPLUS digital electronic modules

## Overview



- 2, 4 and 8-channel digital inputs and outputs for the ET 200S
- Can be plugged onto TM-E terminal modules with automatic coding
- High-feature versions for enhanced plant availability, additional functions and comprehensive diagnostics
- Hot swapping of modules possible

**Note:**

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

|                           | SIPLUS digital input module<br>4 DI 24 V DC Standard                                  | SIPLUS digital input module<br>4 DI 24 V DC High Feature | SIPLUS digital input module<br>8 DI 24 V DC Standard |
|---------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------|
| Order number              | 6AG1 131-4BD01-2AA0                                                                   | 6AG1 131-4BD01-7AB0                                      | 6AG1 131-4BF00-7AA0                                  |
| Order number based on     | 6ES7 131-4BD01-0AA0                                                                   | 6ES7 131-4BD01-0AB0                                      | 6ES7 131-4BF00-0AA0                                  |
| Ambient temperature range | -25 ... +60 °C                                                                        | -25 ... +70 °C                                           |                                                      |
| Conformal coating         | Coating of the printed circuit boards and the electronic components                   |                                                          |                                                      |
| Technical data            | The technical data of the standard product applies except for the ambient conditions. |                                                          |                                                      |

|                           | SIPLUS digital input module<br>8 DI SOURCE INPUT 24 V DC                              | SIPLUS digital output module<br>2 DO 24 V DC/0.5 A High Feature | SIPLUS digital output module<br>2 DO 24 V DC/2 A High Feature |
|---------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------|
| Order number              | 6AG1 131-4BF50-7AA0                                                                   | 6AG1 132-4BB01-2AB0                                             | 6AG1 132-4BB31-7AB0                                           |
| Order number based on     | 6ES7 131-4BF50-0AA0                                                                   | 6ES7 132-4BB01-0AB0                                             | 6ES7 132-4BB31-0AB0                                           |
| Ambient temperature range | -40 ... +70 °C                                                                        | -25 ... +60 °C                                                  | -25 ... +70 °C                                                |
| Conformal coating         | Coating of the printed circuit boards and the electronic components                   |                                                                 |                                                               |
| Technical data            | The technical data of the standard product applies except for the ambient conditions. |                                                                 |                                                               |

|                           | SIPLUS digital output module<br>4 DO 24 V DC/0.5 A Standard                           | SIPLUS digital output module<br>4 DO 24 V DC/2 A Standard | SIPLUS digital output module<br>8 DO 24 V DC/0.5 A Standard |
|---------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|
| Order number              | 6AG1 132-4BD02-7AA0                                                                   | 6AG1 132-4BD32-2AA0                                       | 6AG1 132-4BF00-7AA0                                         |
| Order number based on     | 6ES7 132-4BD02-0AA0                                                                   | 6ES7 132-4BD32-0AA0                                       | 6ES7 132-4BF00-0AA0                                         |
| Ambient temperature range | -25 ... +70 °C                                                                        | -25 ... +60 °C                                            | -25 ... +70 °C                                              |
| Conformal coating         | Coating of the printed circuit boards and the electronic components                   |                                                           |                                                             |
| Technical data            | The technical data of the standard product applies except for the ambient conditions. |                                                           |                                                             |

|                           | SIPLUS digital output module<br>8 DO 24 V DC/0.5 A Standard<br>SOURCE OUTPUT          | SIPLUS digital output module<br>2 DO 24 V DC to 230 V AC/5 A<br>relay, NO contact | SIPLUS digital output module<br>2 DO 24...48 V DC/5 A, 24...230 V<br>AC/5 A relay, changeover contact |
|---------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Order number              | 6AG1 132-4BF50-7AA0                                                                   | 6AG1 132-4HB01-2AB0                                                               | 6AG1 132-4HB12-2AB0                                                                                   |
| Order number based on     | 6ES7 132-4BF50-0AA0                                                                   | 6ES7 132-4HB01-0AB0                                                               | 6ES7 132-4HB12-0AB0                                                                                   |
| Ambient temperature range | -25 ... +70 °C                                                                        | -25 ... +70 °C                                                                    | -25 ... +60 °C                                                                                        |
| Conformal coating         | Coating of the printed circuit boards and the electronic components                   |                                                                                   |                                                                                                       |
| Technical data            | The technical data of the standard product applies except for the ambient conditions. |                                                                                   |                                                                                                       |

# SIMATIC ET 200 distributed I/O

## ET 200S

SIPLUS I/O modules  
SIPLUS digital electronic modules

### Overview (continued)

#### Ambient conditions

|                                                                                    |                                                                                                                                                                                                |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relative humidity                                                                  | 5 ... 100 %<br>Condensation permissible                                                                                                                                                        |
| Biologically active substances                                                     | Conformity with EN 60721-3-3,<br>Class 3B2 mold and fungal<br>spores (except fauna)                                                                                                            |
| Chemically active substances                                                       | Conformity with EN 60721-3-3,<br>Class 3C4 incl. salt mist and<br>ISA-S71.04 severity level G1; G2;<br>G3; GX <sup>1) 2)</sup>                                                                 |
| Mechanically active substances                                                     | Conformity with EN 60721-3-3,<br>Class 3S4 including conductive<br>sand, dust <sup>2)</sup>                                                                                                    |
| Air pressure (depending on the<br>highest positive temperature range<br>specified) | 1080 ... 795 hPa<br>(-1000 ... +2000 m)<br>see ambient temperature range<br>795 ... 658 hPa<br>(+2000 ... +3500 m)<br>derating 10 K<br>658 ... 540 hPa<br>(+3500 ... +5000 m)<br>derating 20 K |

- <sup>1)</sup> ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm;  
H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm;  
NH<sub>3</sub> < 49 ppm; O<sub>3</sub> < 0.1 ppm; NOX < 5.2 ppm  
Limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm;  
Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH<sub>3</sub> < 247 ppm;  
O<sub>3</sub> < 1.0 ppm; NOX < 10.4 ppm
- <sup>2)</sup> The supplied plug covers must remain in place over the unused  
interface when operated in atmospheres containing corrosive gases!

For further technical documentation on SIPLUS, see:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

### Ordering data

### Order No.

#### SIPLUS digital input modules

(extended temperature range and  
medial exposure)

Ordering unit 5 units

|                             |   |                            |
|-----------------------------|---|----------------------------|
| • 4 DI 24 V DC Standard     | L | <b>6AG1 131-4BD01-2AA0</b> |
| • 4 DI 24 V DC High Feature | L | <b>6AG1 131-4BD01-7AB0</b> |
| • 8 DI 24 V DC Standard     | H | <b>6AG1 131-4BF00-7AA0</b> |

Ordering unit 1 unit

|                             |   |                            |
|-----------------------------|---|----------------------------|
| • 8 DI 24 V DC Source Input | H | <b>6AG1 131-4BF50-7AA0</b> |
|-----------------------------|---|----------------------------|

#### SIPLUS digital output modules

(extended temperature range and  
medial exposure)

Ordering unit 5 units

|                                                                            |   |                            |
|----------------------------------------------------------------------------|---|----------------------------|
| • 2 DO 24 V DC/0.5 A High<br>Feature                                       | H | <b>6AG1 132-4BB01-2AB0</b> |
| • 2 DO 24 V DC/2 A High Feature                                            | H | <b>6AG1 132-4BB31-7AB0</b> |
| • 4 DO 24 V DC/0.5 A Standard                                              | H | <b>6AG1 132-4BD02-7AA0</b> |
| • 4 DO 24 V DC/2 A Standard                                                | H | <b>6AG1 132-4BD32-2AA0</b> |
| • 2 DO 24 V DC to 230 V AC/5 A<br>relay, NO contact                        | H | <b>6AG1 132-4HB01-2AB0</b> |
| • 2 DO 24...48 V DC/5 A,<br>24...230 V AC/5 A relay,<br>changeover contact | H | <b>6AG1 132-4HB12-2AB0</b> |

Ordering unit 1 unit

|                                                   |   |                            |
|---------------------------------------------------|---|----------------------------|
| • 8 DO 24 V DC/0.5 A Standard                     | H | <b>6AG1 132-4BF00-7AA0</b> |
| • 8 DO, 24 V DC / 0.5 A Standard<br>SOURCE OUTPUT | H | <b>6AG1 132-4BF50-7AA0</b> |

#### Accessories

See SIMATIC ET 200S digital  
electronic modules, page 9/73

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N

# SIMATIC ET 200 distributed I/O

## ET 200S

SIPLUS I/O modules  
SIPLUS analog electronic modules

### Overview



- Analog inputs and outputs for the ET 200S
- Can be plugged onto TM-E terminal modules with automatic coding
- High-speed versions with extremely short isochronous cycle times
- Hot swapping of modules possible

#### Notes:

Consult the configuring guide for selection of the appropriate TM-E terminal modules.

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

| SIPLUS analog electronic module 2 AI I Standard 4-wire |                                                                                |
|--------------------------------------------------------|--------------------------------------------------------------------------------|
| Order No.                                              | 6AG1 134-4GB11-2AB0                                                            |
| Order No. based on                                     | 6ES7 134-4GB11-0AB0                                                            |
| Ambient temperature range                              | -25 ... +60 °C                                                                 |
| Ambient conditions                                     | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data                                         | The technical data are identical with those of the based-on modules.           |

| SIPLUS analog electronic module 2 AI I High Feature |                                                                                |
|-----------------------------------------------------|--------------------------------------------------------------------------------|
| Order No.                                           | 6AG1 134-4MB02-2AB0                                                            |
| Order No. based on                                  | 6ES7 134-4MB02-0AB0                                                            |
| Ambient temperature range                           | -25 ... +60 °C                                                                 |
| Ambient conditions                                  | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data                                      | The technical data are identical with those of the based-on modules.           |

| SIPLUS analog electronic module 2 AI High Speed |                                                                                |
|-------------------------------------------------|--------------------------------------------------------------------------------|
| Order No.                                       | 6AG1 134-4GB52-2AB0                                                            |
| Order No. based on                              | 6ES7 134-4GB52-0AB0                                                            |
| Ambient temperature range                       | -25 ... +60 °C                                                                 |
| Ambient conditions                              | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data                                  | The technical data are identical with those of the based-on modules.           |

| SIPLUS analog electronic module 2 AI U Standard |                                                                                |
|-------------------------------------------------|--------------------------------------------------------------------------------|
| Order No.                                       | 6AG1 134-4FB01-2AB0                                                            |
| Order No. based on                              | 6ES7 134-4FB01-0AB0                                                            |
| Ambient temperature range                       | -25 ... +60 °C                                                                 |
| Ambient conditions                              | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data                                  | The technical data are identical with those of the based-on modules.           |

| SIPLUS analog electronic module 4 AI I Standard 2-wire |                                                                                |
|--------------------------------------------------------|--------------------------------------------------------------------------------|
| Order No.                                              | 6AG1 134-4GD00-2AB0                                                            |
| Order No. based on                                     | 6ES7 134-4GD00-0AB0                                                            |
| Ambient temperature range                              | -25 ... +60 °C                                                                 |
| Ambient conditions                                     | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data                                         | The technical data are identical with those of the based-on modules.           |

| SIPLUS analog electronic module 2 AI I Standard 2-wire |                                                                                |
|--------------------------------------------------------|--------------------------------------------------------------------------------|
| Order No.                                              | 6AG1 134-4GB01-2AB0                                                            |
| Order No. based on                                     | 6ES7 134-4GB01-0AB0                                                            |
| Ambient temperature range                              | -25 ... +60 °C                                                                 |
| Ambient conditions                                     | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data                                         | The technical data are identical with those of the based-on modules.           |

| SIPLUS analog electronic module 2 AI RTD |                                                                                |
|------------------------------------------|--------------------------------------------------------------------------------|
| Order No.                                | 6AG1 134-4JB51-7AB0                                                            |
| Order No. based on                       | 6ES7 134-4JB51-0AB0                                                            |
| Ambient temperature range                | -25 ... +60 °C                                                                 |
| Ambient conditions                       | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data                           | The technical data are identical with those of the based-on modules.           |



## Overview (continued)

| SIPLUS analog electronic module 2 AI RTD High Feature |                                                                                |
|-------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>                                      | <b>6AG1 134-4NB51-2AB0</b>                                                     |
| <b>Order No. based on</b>                             | <b>6ES7 134-4NB51-0AB0</b>                                                     |
| Ambient temperature range                             | -25 ... +60 °C                                                                 |
| Ambient conditions                                    | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data                                        | The technical data are identical with those of the based-on modules.           |

| SIPLUS analog electronic module 2 AI TC High Feature |                                                                                |
|------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>                                     | <b>6AG1 134-4NB01-7AB0</b>                                                     |
| <b>Order No. based on</b>                            | <b>6ES7 134-4NB01-0AB0</b>                                                     |
| Ambient temperature range                            | 0 ... +70 °C                                                                   |
| Ambient conditions                                   | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data                                       | The technical data are identical with those of the based-on modules.           |

| SIPLUS analog electronic module 2 AO U Standard |                                                                                |
|-------------------------------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>                                | <b>6AG1 135-4FB01-2AB0</b>                                                     |
| <b>Order No. based on</b>                       | <b>6ES7 135-4FB01-0AB0</b>                                                     |
| Ambient temperature range                       | -25 ... +60 °C                                                                 |
| Ambient conditions                              | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data                                  | The technical data are identical with those of the based-on modules.           |

| SIPLUS analog electronic module 2 AO U High Feature |                                                                                |
|-----------------------------------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>                                    | <b>6AG1 135-4LB02-7AB0</b>                                                     |
| <b>Order No. based on</b>                           | <b>6ES7 135-4LB02-0AB0</b>                                                     |
| Ambient temperature range                           | -25 ... +60 °C                                                                 |
| Ambient conditions                                  | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |

| SIPLUS analog electronic module 2 AO U High Feature |                                                                      |
|-----------------------------------------------------|----------------------------------------------------------------------|
| Technical data                                      | The technical data are identical with those of the based-on modules. |

| SIPLUS analog electronic module 2 AO I Standard |                                                                                |
|-------------------------------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>                                | <b>6AG1 135-4GB01-2AB0</b>                                                     |
| <b>Order No. based on</b>                       | <b>6ES7 135-4GB01-0AB0</b>                                                     |
| Ambient temperature range                       | -25 ... +70 °C                                                                 |
| Ambient conditions                              | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data                                  | The technical data are identical with those of the based-on modules.           |

## Ambient conditions

|                                                                              |                                                                                                                                                                                                |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relative humidity                                                            | 5 ... 100 %<br>Condensation permissible                                                                                                                                                        |
| Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                                  |
| Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                                          |
| Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                                          |
| Air pressure (depending on the highest positive temperature range specified) | 1080 ... 795 hPa<br>(-1000 ... +2000 m)<br>see ambient temperature range<br>795 ... 658 hPa<br>(+2000 ... +3500 m)<br>derating 10 K<br>658 ... 540 hPa<br>(+3500 ... +5000 m)<br>derating 20 K |

<sup>1)</sup> ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm; H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O<sub>3</sub> < 0.1 ppm; NOX < 5.2 ppm  
Limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O<sub>3</sub> < 1.0 ppm; NOX < 10.4 ppm

<sup>2)</sup> The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

## Ordering data

| SIPLUS analog input modules                         |   | Order No.                  |
|-----------------------------------------------------|---|----------------------------|
| (extended temperature range and medial exposure)    |   |                            |
| • 2 AI U Standard                                   | L | <b>6AG1 134-4FB01-2AB0</b> |
| • 2 AI I Standard 2-wire                            | H | <b>6AG1 134-4GB01-2AB0</b> |
| • 2 AI I Standard 4-wire                            | H | <b>6AG1 134-4GB11-2AB0</b> |
| • 2 AI I High Feature 2-wire/4-wire (15 bit + sign) |   | <b>6AG1 134-4MB02-2AB0</b> |
| • 2 AI High Speed 2-wire                            | H | <b>6AG1 134-4GB52-2AB0</b> |
| • 4 AI Standard 2-wire                              | H | <b>6AG1 134-4GD00-2AB0</b> |

## Order No.

| • 2 AI RTD Standard          | I | <b>6AG1 134-4JB51-7AB0</b>                               |
|------------------------------|---|----------------------------------------------------------|
| • 2 AI RTD High Feature      | H | <b>6AG1 134-4NB51-2AB0</b>                               |
| • 2 AI TC High Feature       | I | <b>6AG1 134-4NB01-7AB0</b>                               |
| SIPLUS analog output modules |   |                                                          |
| • 2 AO U Standard            | H | <b>6AG1 135-4FB01-2AB0</b>                               |
| • 2 AO U High Feature        | H | <b>6AG1 135-4LB02-7AB0</b>                               |
| • 2 AO I Standard            | H | <b>6AG1 135-4GB01-2AB0</b>                               |
| <b>Accessories</b>           |   | See SIMATIC ET 200S analog electronic modules, page 9/91 |

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

I: Subject to export regulations AL: N and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N



## SIMATIC ET 200 distributed I/O

## ET 200S

SIPLUS technology modules  
SIPLUS 1 SI interface module

## Overview



- 1-channel module for serial data communication via point-to-point link
- For message frames max. 200 byte long
- RS-232C, RS-422, RS-485
- 2 versions
  - ASCII and 3964 (R) protocols
  - Modbus and USS protocols
- Configuration via GSD file or STEP 7 (from V5.1)

**Note:**

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**SIPLUS 1SI interface module**

|                           |                                                                                       |                            |
|---------------------------|---------------------------------------------------------------------------------------|----------------------------|
| <b>Order No.</b>          | <b>6AG1 138-4DF01-7AB0</b>                                                            | <b>6AG1 138-4DF11-7AB0</b> |
| <b>Order No. based on</b> | <b>6ES7 138-4DF01-0AB0</b>                                                            | <b>6ES7 138-4DF11-0AB0</b> |
| Ambient temperature range | -25 °C to +70 °C                                                                      |                            |
| Conformal coating         | Coating of the printed circuit boards and the electronic components                   |                            |
| Technical data            | The technical data of the standard product applies except for the ambient conditions. |                            |

**Ambient conditions**

- Relative humidity  
5 ... 100 %  
condensation permitted
- Biologically active substances  
Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
- Chemically active substances  
Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA -S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>
- Mechanically active substances  
Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>
- Air pressure (depending on the highest positive temperature range specified)  
1080...795 hPa (-ET 200pro ... +2000 m)  
See ambient temperature range  
795...658 hPa (+2000 ... +3500 m)  
Derating 10 K  
658...540 hPa (+3500 ... +5000m)  
Derating 20K

<sup>1)</sup> ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> <4.8 ppm H<sub>2</sub>S <9.9 ppm; Cl <0.2 ppm; HCl <0.66 ppm; HF <0.12 ppm; NH <49 ppm; O<sub>3</sub> <0.1 ppm; NO<sub>x</sub> <5.2 ppm  
Threshold/ limit value (max. 30 min/d): SO<sub>2</sub> <17.8 ppm; H<sub>2</sub>S <49.7 ppm; Cl <1.0 ppm; HCl <3.3 ppm; HF <2.4 ppm; NH <247 ppm; O<sub>3</sub> <1.0 ppm; NO<sub>x</sub> <10.4 ppm

<sup>2)</sup> The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

| Ordering data                                                                    | Order No.                                     |
|----------------------------------------------------------------------------------|-----------------------------------------------|
| <b>1 SI interface module</b><br>(extended temperature range and medial exposure) |                                               |
| • ASCII and 3964(R) protocols L                                                  | <b>6AG1 138-4DF11-7AB0</b>                    |
| • Modbus and USS protocols H                                                     | <b>6AG1 138-4DF01-7AB0</b>                    |
| <b>Accessories</b>                                                               | See SIMATIC 1 SI interface module, page 9/105 |

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N

## Overview



- Single-channel, intelligent 32 bit counter module for universal counting and measuring tasks
- For direct connection of 24 V incremental encoders or initiators
- Comparison functions with definable comparison values
- Integrated digital output for output of the response on reaching the comparison value
- Can be plugged onto TM-E terminal modules with automatic coding
- Hot swapping of modules possible
- Simple parameterization without additional software

### Notes:

Position measuring systems and preassembled connecting cables for the counting and positioning functions are provided by SIMODRIVE Sensor or Motion Connect 500.

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

| SIPLUS 1 COUNT counter module 24 V/100 kHz                                   |                                                                                                                                                                                                |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Order No.                                                                    | <b>6AG1 138-4DA04-2AB0</b>                                                                                                                                                                     |
| Order No. based on                                                           | <b>6ES7 138-4DA04-0AB0</b>                                                                                                                                                                     |
| Ambient temperature range                                                    | -25 °C to +60 °C                                                                                                                                                                               |
| Conformal coating                                                            | Coating of the printed circuit boards and the electronic components                                                                                                                            |
| Technical data                                                               | The technical data of the standard product applies except for the ambient conditions.                                                                                                          |
| <b>Ambient conditions</b>                                                    |                                                                                                                                                                                                |
| Relative humidity                                                            | 5 ... 100 %<br>Condensation permissible                                                                                                                                                        |
| Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                                  |
| Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                                          |
| Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                                          |
| Air pressure (depending on the highest positive temperature range specified) | 1080 ... 795 hPa<br>(-1000 ... +2000 m)<br>see ambient temperature range<br>795 ... 658 hPa<br>(+2000 ... +3500 m)<br>derating 10 K<br>658 ... 540 hPa<br>(+3500 ... +5000 m)<br>derating 20 K |

- 1) ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm; H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O<sub>3</sub> < 0.1 ppm; NOX < 5.2 ppm  
Limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O<sub>3</sub> < 1.0 ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:  
[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

| Ordering data                                           | Order No.                                                   |
|---------------------------------------------------------|-------------------------------------------------------------|
| <b>SIPLUS 1 COUNT counter module 24 V/100 kHz</b>       | <b>6AG1 138-4DA04-2AB0</b>                                  |
| (extended temperature range and medial exposure)        |                                                             |
| For universal counting and measuring tasks with ET 200S |                                                             |
| <b>Accessories</b>                                      | See SIMATIC 1 COUNT counter module 24 V/100 kHz, page 9/100 |

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200S

**SIPLUS I/O modules**  
Terminal modules for power and electr. modules

### Overview



- Mechanical modules as receptacles for the electronic modules
- For setting up permanent wiring via build-as-you-go voltage buses
- Positive-fit connection technology to ensure enhanced vibration resistance of up to 5 g
- Different versions as receptacles for power modules and electronic modules
- Replaceable terminal box (even within the station network)
- Automatic coding of the electronic modules
- Build-as-you-go shielding of the backplane bus for high data security
- Color coding facility for the terminals and for identifying the slot numbers
- Alternatively available with screw-type or spring-loaded terminals as well as with no-strip fast connection system "FastConnect" for up to 60% quicker process wiring

#### Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

| SIPLUS DP TM-P12S23-A0    |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>          | <b>6AG1 193-4CD20-2AA0</b>                                                     |
| <b>Order No. based on</b> | <b>6ES7 193-4CD20-0AA0</b>                                                     |
| Ambient temperature range | -25 ... +60 °C                                                                 |
| Ambient conditions        | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data            | The technical data are identical with those of the based-on modules.           |

| SIPLUS DP TM-P15C23-A1    |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>          | <b>6AG1 193-4CD30-2AA0</b>                                                     |
| <b>Order No. based on</b> | <b>6ES7 193-4CD30-0AA0</b>                                                     |
| Ambient temperature range | -25 ... +60 °C                                                                 |
| Ambient conditions        | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data            | The technical data are identical with those of the based-on modules.           |

| SIPLUS DP TM-P15C22-01    |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>          | <b>6AG1 193-4CE10-2AA0</b>                                                     |
| <b>Order No. based on</b> | <b>6ES7 193-4CE10-0AA0</b>                                                     |
| Ambient temperature range | -40 ... +70 °C                                                                 |
| Ambient conditions        | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data            | The technical data are identical with those of the based-on modules.           |

| SIPLUS DP TM-E15C23-01    |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>          | <b>6AG1 193-4CB10-7AA0</b>                                                     |
| <b>Order No. based on</b> | <b>6ES7 193-4CB10-0AA0</b>                                                     |
| Ambient temperature range | 0 ... +70 °C                                                                   |
| Ambient conditions        | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data            | The technical data are identical with those of the based-on modules.           |

| SIPLUS DP TM-E15N24-01    |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>          | <b>6AG1 193-4CB70-7AA0</b>                                                     |
| <b>Order No. based on</b> | <b>6ES7 193-4CB70-0AA0</b>                                                     |
| Ambient temperature range | -40 ... +70 °C                                                                 |
| Ambient conditions        | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data            | The technical data are identical with those of the based-on modules.           |

#### Overview (continued)

| SIPLUS DP TM-E15C24-A1    |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>          | <b>6AG1 193-4CA30-2AA0</b>                                                     |
| <b>Order No. based on</b> | <b>6ES7 193-4CA30-0AA0</b>                                                     |
| Ambient temperature range | -25 ... +60 °C                                                                 |
| Ambient conditions        | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data            | The technical data are identical with those of the based-on modules.           |

| SIPLUS DP TM-E15C24-A1    |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>          | <b>6AG1 193-4CB30-2AA0</b>                                                     |
| <b>Order No. based on</b> | <b>6ES7 193-4CB30-0AA0</b>                                                     |
| Ambient temperature range | -25 ... +60 °C                                                                 |
| Ambient conditions        | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data            | The technical data are identical with those of the based-on modules.           |

| SIPLUS DP TM-E15S26-A1    |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>          | <b>6AG1 193-4CA40-2AA0</b>                                                     |
| <b>Order No. based on</b> | <b>6ES7 193-4CA40-0AA0</b>                                                     |
| Ambient temperature range | -25 ... +60 °C                                                                 |
| Ambient conditions        | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data            | The technical data are identical with those of the based-on modules.           |

| SIPLUS DP TM-E15C26-A1    |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>          | <b>6AG1 193-4CA50-2AA0</b>                                                     |
| <b>Order No. based on</b> | <b>6ES7 193-4CA50-0AA0</b>                                                     |
| Ambient temperature range | -25 ... +60 °C                                                                 |
| Ambient conditions        | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data            | The technical data are identical with those of the based-on modules.           |

| SIPLUS DP TM-E30C44-01    |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>          | <b>6AG1 193-4CG30-2AA0</b>                                                     |
| <b>Order No. based on</b> | <b>6ES7 193-4CG30-0AA0</b>                                                     |
| Ambient temperature range | -25 ... +60 °C                                                                 |
| Ambient conditions        | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data            | The technical data are identical with those of the based-on modules.           |

| SIPLUS DP TM-E30C46-A1    |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>          | <b>6AG1 193-4CF50-7AA0</b>                                                     |
| <b>Order No. based on</b> | <b>6ES7 193-4CF50-0AA0</b>                                                     |
| Ambient temperature range | -40 ... +70 °C                                                                 |
| Ambient conditions        | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data            | The technical data are identical with those of the based-on modules.           |

| SIPLUS DP TM-E15C24-AT    |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| <b>Order No.</b>          | <b>6AG1 193-4CL30-7AA0</b>                                                     |
| <b>Order No. based on</b> | <b>6ES7 193-4CL30-0AA0</b>                                                     |
| Ambient temperature range | 0 ... +70 °C                                                                   |
| Ambient conditions        | Suitable for exceptional medial exposure (e.g. in sulfur chloride atmosphere). |
| Technical data            | The technical data are identical with those of the based-on modules.           |

| Ambient conditions                                                           |                                                                                                                                                                                                |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relative humidity                                                            | 5 ... 100 %<br>Condensation permissible                                                                                                                                                        |
| Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                                  |
| Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                                          |
| Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                                          |
| Air pressure (depending on the highest positive temperature range specified) | 1080 ... 795 hPa<br>(-1000 ... +2000 m)<br>see ambient temperature range<br>795 ... 658 hPa<br>(+2000 ... +3500 m)<br>derating 10 K<br>658 ... 540 hPa<br>(+3500 ... +5000 m)<br>derating 20 K |

- 1) ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm; H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O<sub>3</sub> < 0.1 ppm; NOX < 5.2 ppm  
Limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O<sub>3</sub> < 1.0 ppm; NOX < 10.4 ppm

- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

For further technical documentation on SIPLUS, see:  
[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

# SIMATIC ET 200 distributed I/O

## ET 200S

### SIPLUS I/O modules

#### Terminal modules for power and electr. modules

#### Ordering data

#### Order No.

##### TM-P terminal modules for PM-E power modules

(extended temperature range and medial exposure)

##### SIPLUS ET 200S TM-P15C23-A0

Ordering unit: 1 unit  
2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw connection

##### SIPLUS ET 200S TM-P15C23-A0

Ordering unit: 1 unit  
2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals

##### SIPLUS ET 200S TM-P15C22-01

Ordering unit: 1 unit  
2 x 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

##### TM-E terminal modules for electronic modules

(extended temperature range and medial exposure)

##### SIPLUS ET 200S TM-E15C23-01

Ordering unit: 5 units  
2 x 3 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

##### SIPLUS ET 200S TM-E15N24-01

Ordering unit: 5 units  
2 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect

##### SIPLUS ET 200S TM-E15C24-A1

Ordering unit: 5 units  
2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

##### SIPLUS ET 200S TM-E15C24-01

Ordering unit: 5 units  
2 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

##### SIPLUS ET 200S TM-E15S26-A1

Ordering unit: 5 units  
2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals

##### SIPLUS ET 200S TM-E15C26-A1

Ordering unit: 5 units  
2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

6AG1 193-4CD20-2AA0

6AG1 193-4CD30-2AA0

6AG1 193-4CE10-2AA0

6AG1 193-4CB10-7AA0

6AG1 193-4CB70-7AA0

6AG1 193-4CA30-2AA0

6AG1 193-4CB30-2AA0

6AG1 193-4CA40-2AA0

6AG1 193-4CA50-2AA0

#### Order No.

##### SIPLUS ET 200S TM-E30C44-01

Ordering unit: 1 unit  
4 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

##### SIPLUS ET 200S TM-E30C46-A1

Ordering unit: 1 unit  
4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

##### SIPLUS ET 200S TM-E15C24-AT

Ordering unit: 1 unit  
For internal temperature compensation with 2 AI TC High Feature, spring-loaded terminals

##### Accessories for shield connection

##### Shield connection element

Ordering unit: 5 units  
For plugging into TM-E and TM-P

##### Shield clamps

Ordering unit: 5 units  
For busbar 3 x 10 mm

##### Ground terminal

Ordering unit: 1 unit  
For cable cross-sections up to 25 mm<sup>2</sup>

##### Busbars 3 x 10 mm

Ordering unit: 1 unit

6AG1 193-4CG30-2AA0

6AG1 193-4CF50-7AA0

6AG1 193-4CL30-7AA0

6ES7 193-4GA00-0AA0

6ES7 193-4GB00-0AA0

8WA2 868

8WA2 842

##### Accessories for coding

##### Color coding plates

Ordering unit: 200 units for TM-P, TM-E

- White
- Yellow
- Yellow/green
- Red
- Blue
- Brown
- Turquoise

6ES7 193-4LA20-0AA0  
6ES7 193-4LB20-0AA0  
6ES7 193-4LC20-0AA0  
6ES7 193-4LD20-0AA0  
6ES7 193-4LF20-0AA0  
6ES7 193-4LG20-0AA0  
6ES7 193-4LH20-0AA0

##### Labels, inscribed

Ordering unit: 1 set

200 units for slot numbering (1 ... 20) 10 x

200 units for slot numbering (1 ... 40) 5 x

200 units for slot numbering (1 ... 64) 1 x, (1 ... 68) 2 x

8WA8 861-0AB

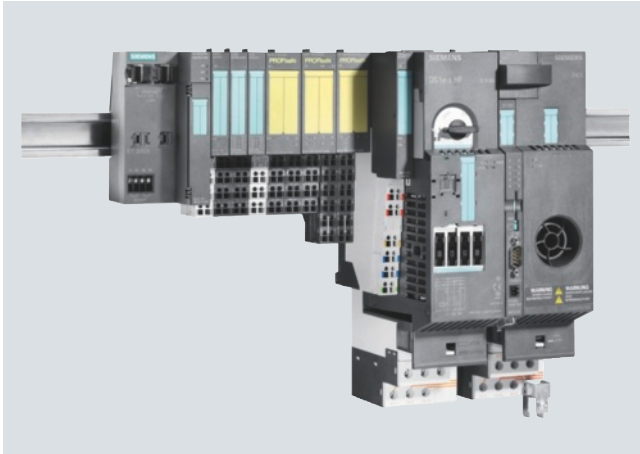
8WA8 861-0AC

8WA8 861-0DA

##### Labels, blank

200 units for slot numbering

8WA8 848-2AY

**Overview**

The fail-safe SIMATIC S7 CPUs, plus the fail-safe signal modules of SIMATIC ET 200S / ET200 / 200pro/ ET200eco and ET200M have been specially developed for distributed applications in manufacturing systems. Thanks to the discrete structure of the F I/Os, safety technology is only applied where actually required. The new system replaces conventional electromechanical components, such as:

- Freely programmable safe linking of sensors to actuators;
- Selective safe shutdown of actuators;
- Hybrid configurations of F modules (F stands for fail-safe) and standard modules in a station;
- Single-bus concept, F signals and standard signals are transferred over one bus medium (PROFIBUS DP, PROFINET).

**Totally Integrated Automation (TIA)**

Safety technology (Safety Integrated) is a component of Totally Integrated Automation resulting in the total integration of safety and standard automation (SIMATIC S7).

Whereas today, standard automation (conventional PLCs) and safety automation (electromechanics) are still separate, these two worlds are growing closer together to form one uniform, integrated overall system.

Siemens can therefore present itself as a complete supplier for automation engineering for which safety technology is part of the standard automation and uniformity exists throughout the complete system.

## SIMATIC ET 200 distributed I/O

## ET 200S

## Fail-safe I/O modules

## PM-E F PROFIsafe F power module

## Overview



Fail-safe PM-E F PROFIsafe power modules for safety shutdown of standard digital output modules.

- Up to 2 fail-safe digital outputs onboard (source/sink outputs, up to 2A, up to SIL3/Cat. 4)
- The standard digital output modules can be shut down up to Cat.3 (EN 954) and SIL 2 (IEC61508) up to 10 A. The following modules can be used down-circuit of the power modules.
  - 2DO / 0.5 A ST 6ES7 132-4BB01-0AA0
  - 2 DO / 2 A ST 6ES7 132-4BB31-0AA0
  - 2 DO / 0.5 A HF 6ES7 132-4BB01-0AB0
  - 2 DO / 2 A HF 6ES7 132-4BB31-0AB0
  - 4 DO / 0.5 A ST 6ES7 132-4BD01-0AA0
  - 4 DO / 2 A ST 6ES7 132-4BD31-0AA0

The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations. They can be used with all fail-safe SIMATIC S7-CPU's.

## Technical specifications

|                                               | 6ES7 138-4CF03-0AB0                                                                                                                                                                        | 6ES7 138-4CF42-0AB0                   |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <b>Power supply</b>                           |                                                                                                                                                                                            |                                       |
| Current carrying capacity                     |                                                                                                                                                                                            |                                       |
| • Current carrying capacity up to 30 °C, max. |                                                                                                                                                                                            | 10 A                                  |
| • Current carrying capacity up to 40 °C, max. | 10 A                                                                                                                                                                                       | 8 A                                   |
| • Current carrying capacity up to 60 °C, max. | 6 A                                                                                                                                                                                        | 7 A                                   |
| <b>Supply voltages</b>                        |                                                                                                                                                                                            |                                       |
| Load voltage L+                               |                                                                                                                                                                                            |                                       |
| • Rated value (DC)                            | 24 V                                                                                                                                                                                       | 24 V                                  |
| • Reverse polarity protection                 | No                                                                                                                                                                                         | No                                    |
| <b>Current consumption</b>                    |                                                                                                                                                                                            |                                       |
| from load voltage L+ (without load), max.     | Typ. 100 mA                                                                                                                                                                                | Typ. 100 mA                           |
| from backplane bus 24 V DC, max.              | 28 mA                                                                                                                                                                                      | 28 mA                                 |
| <b>Power losses</b>                           |                                                                                                                                                                                            |                                       |
| Power loss, typ.                              | 4 W                                                                                                                                                                                        | 4 W                                   |
| <b>Address area</b>                           |                                                                                                                                                                                            |                                       |
| Address space per module                      |                                                                                                                                                                                            |                                       |
| • without packing                             | 5 byte; input and output in each case                                                                                                                                                      | 5 byte; input and output in each case |
| <b>Digital inputs</b>                         |                                                                                                                                                                                            |                                       |
| Cable length                                  |                                                                                                                                                                                            |                                       |
| • Cable length, shielded, max.                | 200 m                                                                                                                                                                                      | 200 m                                 |
| • Cable length unshielded, max.               | 200 m                                                                                                                                                                                      | 200 m                                 |
| <b>Digital outputs</b>                        |                                                                                                                                                                                            |                                       |
| Number of digital outputs                     | 2                                                                                                                                                                                          | 1; Relay                              |
| Short-circuit protection                      | Yes; Electronic                                                                                                                                                                            | No                                    |
| • Response threshold, typ.                    | Response threshold (short-circuit): 5 to 12 A;<br>response threshold (external short-circuit to ground): 5 to 12 A; response threshold (external short-circuit to P potential): 25 to 45 A |                                       |
| Limitation of inductive shutdown voltage to   | L+ (-2x 47 V)                                                                                                                                                                              |                                       |
| Lamp load, max.                               | 10 W                                                                                                                                                                                       | 100 W                                 |
| Controlling a digital input                   | No                                                                                                                                                                                         | Yes                                   |
| Output voltage                                |                                                                                                                                                                                            |                                       |
| • for signal "1", min.                        | L+ (-2.0 V), current-sourcing switch:<br>L+ (-1.5 V), voltage drop at current-sinking switch: max. 0.5 V                                                                                   |                                       |



**Technical specifications** (continued)

|                                                         | 6ES7 138-4CF03-0AB0 | 6ES7 138-4CF42-0AB0                                                           |
|---------------------------------------------------------|---------------------|-------------------------------------------------------------------------------|
| Output current                                          |                     |                                                                               |
| • for signal "1" rated value                            | 2 A                 |                                                                               |
| • for signal "1" permissible range for 0 to 60 °C, min. | 20 mA               |                                                                               |
| • for signal "1" permissible range for 0 to 60 °C, max. | 2.4 A               |                                                                               |
| • for signal "0" residual current, max.                 | 0.5 mA              |                                                                               |
| Parallel switching of 2 outputs                         |                     |                                                                               |
| • for increased power                                   | No                  |                                                                               |
| • for redundant control of a load                       | No                  |                                                                               |
| Switching frequency                                     |                     |                                                                               |
| • with resistive load, max.                             | 30 Hz               | 2 Hz                                                                          |
| • with inductive load, max.                             | 0.1 Hz              | 0.1 Hz; with inductive load according to IEC 947-5-1, 13 DC/15 AC             |
| • on lamp load, max.                                    | 10 Hz               | 2 Hz                                                                          |
| Aggregate current of outputs (per group)                |                     |                                                                               |
| • horizontal installation                               |                     |                                                                               |
| - up to 40 °C, max.                                     | 10 A                | 10 A                                                                          |
| - up to 55 °C, max.                                     | 7 A                 | 8 A                                                                           |
| - up to 60 °C, max.                                     | 6 A                 | 7 A                                                                           |
| • vertical installation                                 |                     |                                                                               |
| - up to 40 °C, max.                                     | 6 A                 | 8 A                                                                           |
| Load resistance range                                   |                     |                                                                               |
| • lower limit                                           | 12 Ω                |                                                                               |
| • upper limit                                           | 1 kΩ                |                                                                               |
| Cable length                                            |                     |                                                                               |
| • Cable length, shielded, max.                          | 200 m               |                                                                               |
| • Cable length unshielded, max.                         | 200 m               |                                                                               |
| <b>Relay outputs</b>                                    |                     |                                                                               |
| Switching capacity of contacts                          |                     |                                                                               |
| • at ohmic load, up to 50 °C, max.                      | 10 A                | 10 A                                                                          |
| <b>Alarms/diagnostics/status information</b>            |                     |                                                                               |
| Diagnostics                                             |                     |                                                                               |
| • Diagnostic functions                                  | Yes                 | Yes                                                                           |
| • Diagnostic information readable                       | Yes                 | Yes                                                                           |
| • Diagnostics                                           | Yes                 |                                                                               |
| • Wire break                                            | Yes                 | No                                                                            |
| • Short circuit                                         | Yes                 | Yes                                                                           |
| • Missing load voltage                                  | Yes                 | Yes                                                                           |
| Diagnostic indication LED                               |                     |                                                                               |
| • Rated load voltage PWR (green)                        | Yes                 | Yes                                                                           |
| • Group error SF (red)                                  | Yes                 | Yes                                                                           |
| • Status indicator digital output (green)               | Yes                 | Yes                                                                           |
| <b>Isolation</b>                                        |                     |                                                                               |
| Isolation checked with                                  | 500 V DC            | 500 V DC                                                                      |
| tested with                                             |                     |                                                                               |
| • Channels against backplane bus and load voltage L+    | 500 V DC            | 500 V DC                                                                      |
| <b>Galvanic isolation</b>                               |                     |                                                                               |
| Galvanic isolation digital outputs                      |                     |                                                                               |
| • between the channels                                  | No                  | No                                                                            |
| • between the channels and the backplane bus            | Yes                 | Yes                                                                           |
| • between the channels and the load voltage L+          | No                  | No                                                                            |
| <b>Standards, approvals, certificates</b>               |                     |                                                                               |
| Highest safety class achievable in safety mode          |                     |                                                                               |
| • acc. to EN 954                                        | Up to Cat. 4        | With Std-DO: max. Cat.3, without Std-DO max. Cat.4 depending on configuration |
| • acc. to IEC 61508                                     | Up to SIL 3         | With Std-DO: max. SIL 2, without Std-DO max. SIL 3 depending on configuration |



# SIMATIC ET 200 distributed I/O

## ET 200S

### Fail-safe I/O modules

#### PM-E F PROFIsafe F power module

#### Technical specifications (continued)

|                              | 6ES7 138-4CF03-0AB0 | 6ES7 138-4CF42-0AB0 |
|------------------------------|---------------------|---------------------|
| <b>Dimensions and weight</b> |                     |                     |
| Dimensions                   |                     |                     |
| • Width                      | 30 mm               | 30 mm               |
| • Height                     | 81 mm               | 81 mm               |
| • Depth                      | 52 mm               | 52 mm               |
| Weight                       |                     |                     |
| • Weight, approx.            | 88 g                | 80 g                |

| Ordering data                                                                                                                                                                                                                                                                  | Order No.                  |                                                                                                                                                                                                                 | Order No.                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>PM-E F pm power module</b><br><b>PROFIsafe, 24 V DC</b><br>for safe shutdown of digital output modules                                                                                                                                                                      | <b>6ES7 138-4CF03-0AB0</b> | <b>Terminal modules for power modules</b>                                                                                                                                                                       |                            |
| <b>PM-E F pp power module</b><br><b>PROFIsafe, 24 V DC</b><br>for safe shutdown of digital output modules                                                                                                                                                                      | <b>6ES7 138-4CF42-0AB0</b> | <b>TM-P30S44-A0</b><br>Ordering unit 1 unit<br>7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals for PM-E F PROFIsafe                                            | <b>6ES7 193-4CK20-0AA0</b> |
| <b>Accessories</b>                                                                                                                                                                                                                                                             |                            | <b>TM-P30C44-A0</b><br>Ordering unit 1 unit<br>7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals for PM-E F PROFIsafe                                         | <b>6ES7 193-4CK30-0AA0</b> |
| <b>IM 151-1 HIGH FEATURE interface module</b><br>for ET 200S; transfer rate up to 12 Mbit/s; data volumes 244 byte each for I/O, up to 63 modules can be connected; connection of PROFIsafe modules, isochronous mode; bus connection via 9-pin Sub-D incl. terminating module | <b>6ES7151-1BA02-0AB0</b>  | <b>Distributed Safety V5.4 programming tool</b><br><b>Task:</b> Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S<br><b>Requirements:</b> STEP 7 V5.3 SP3 and higher       |                            |
| <b>IM 151-3 PN HF interface module</b><br>for ET 200S; transfer rate up to 100 Mbit/s; max. 63 I/O modules up to 2 m wide can be connected; 2 x bus connection via RJ45 connector, incl. terminating module                                                                    | <b>6ES7 151-3BA23-0AB0</b> | Floating license                                                                                                                                                                                                | <b>6ES7 833-1FC02-0YA5</b> |
| <b>IM 151-3 PN FO interface module</b><br>for ET 200S; 2 PROFINET FO interfaces, integrated 2-port switch, max. 63 I/O modules up to 2 m wide can be connected, incl. terminating module                                                                                       | <b>6ES7 151-3BB23-0AB0</b> | Software Update Service                                                                                                                                                                                         | <b>6ES7 833-1FC00-0YX2</b> |
|                                                                                                                                                                                                                                                                                |                            | <b>Distributed Safety Upgrade</b><br>from V5.x to V5.3; Floating license for 1 user                                                                                                                             | <b>6ES7 833-1FC02-0YE5</b> |
|                                                                                                                                                                                                                                                                                |                            | <b>SIMATIC Manual Collection</b> J<br>Electronic manuals on DVD, five languages: S7-200/300/400, C7, LOGO!, SIMATIC DP, PC, PG, STEP 7, engineering software, runtime software, PCS 7, SIMATIC HMI, SIMATIC NET | <b>6ES7 998-8XC01-8YE0</b> |
|                                                                                                                                                                                                                                                                                |                            | <b>SIMATIC Manual Collection update service for 1 year</b> D                                                                                                                                                    | <b>6ES7 998-8XC01-8YE2</b> |

D: Subject to export regulations AL: N and ECCN: 5D992  
J: Subject to export regulations AL: N and ECCN: EAR99S

## Overview



Digital inputs/outputs for the fail-safe SIMATIC S7 systems

Fail-safe digital input module

- For fail-safe reading of sensor information (1 or 2 channels)

- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 2 internal sensor supplies (incl. test function) onboard
- Certified up to Cat. 4 (EN954-1), SIL 3 (IEC 61508), PL e (ISO 13849)

Fail-safe digital output module

- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be driven by up to 2 A
- Certified up to Cat. 4 (EN954-1), SIL 3 (IEC 61508), PL e (ISO 13849)

Fail-safe digital hybrid module

- 4 fail-safe inputs/3 fail-safe outputs
- Certified up to Cat. 3 (EN954-1), SIL 2 (IEC 61508), PL d (ISO 13849)

The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations.

They can be used with all fail-safe SIMATIC S7 CPUs.

## Technical specifications

| 6ES7 138-4FA04-0AB0                                 |                                    |
|-----------------------------------------------------|------------------------------------|
| <b>Supply voltages</b>                              |                                    |
| Rated value                                         |                                    |
| • 24 V DC                                           | Yes                                |
| • permissible range, lower limit (DC)               | 20.4 V                             |
| • permissible range, upper limit (DC)               | 28.8 V                             |
| • Reverse polarity protection                       | No                                 |
| <b>Power losses</b>                                 |                                    |
| Power loss, typ.                                    | 4 W                                |
| <b>Address area</b>                                 |                                    |
| Occupied address area                               |                                    |
| • Outputs                                           | 4 byte                             |
| • Inputs                                            | 6 byte                             |
| <b>Digital inputs</b>                               |                                    |
| Number of digital inputs                            | 8; 8 single channel, 4 two-channel |
| Number of simultaneously controllable inputs        | 8                                  |
| Input characteristic curve acc. to IEC 1131, Type 1 | Yes                                |
| Input voltage                                       |                                    |
| • Rated value, DC                                   | 24 V                               |
| • for signal "0"                                    | -30 to +5 V                        |
| • for signal "1"                                    | 15 to 30 V                         |
| Input current                                       |                                    |
| • for signal "1", typ.                              | 3.7 mA                             |
| Input delay (for rated value of input voltage)      |                                    |
| • for standard inputs                               | Yes                                |
| - parameterizable                                   | 0.3 ms                             |
| - at "0" to "1", min.                               | 17 ms                              |
| - at "0" to "1", max.                               | 0.3 ms                             |
| - at "1" to "0", min.                               | 17 ms                              |
| - at "1" to "0", max.                               |                                    |

| 6ES7 138-4FA04-0AB0                          |                                                     |
|----------------------------------------------|-----------------------------------------------------|
| Cable length                                 |                                                     |
| • Cable length, shielded, max.               | 200 m                                               |
| • Cable length unshielded, max.              | 200 m                                               |
| <b>Encoder supply</b>                        |                                                     |
| Number of outputs                            | 2                                                   |
| Output voltage                               | min. L+ (-1.5 V)                                    |
| Output current, rated value                  | 300 mA                                              |
| Output current, permissible range            | 0 to 300 mA                                         |
| Short-circuit protection                     | Yes; electronic (response threshold 0.7 A to 1.8 A) |
| <b>Encoder</b>                               |                                                     |
| Connectable encoders                         |                                                     |
| • 2-wire BEROs                               | No                                                  |
| <b>Alarms/diagnostics/status information</b> |                                                     |
| Alarms                                       |                                                     |
| • Diagnostic alarm                           | Yes                                                 |
| Diagnostics                                  |                                                     |
| • Diagnostic functions                       | Yes                                                 |
| • Diagnostic information readable            | Yes                                                 |
| • Short circuit                              | Yes                                                 |
| diagnostic indication LED                    |                                                     |
| • Group error SF (red)                       | Yes                                                 |
| • Status indicator digital input (green)     | Yes                                                 |
| <b>Isolation</b>                             |                                                     |
| Isolation checked with                       | 500 V DC                                            |

# SIMATIC ET 200 distributed I/O

## ET 200S

### Fail-safe I/O modules F electronic modules

#### Technical specifications (continued)

| 6ES7 138-4FA04-0AB0                                                            |                 |
|--------------------------------------------------------------------------------|-----------------|
| <b>Galvanic isolation</b>                                                      |                 |
| Galvanic isolation digital inputs                                              |                 |
| • between the channels                                                         | No              |
| • between the channels and the backplane bus                                   | Yes             |
| • between the channels and the load voltage L+                                 | No              |
| <b>Permissible potential difference</b><br>between M internally and the inputs | 75 V DC/60 V AC |

| 6ES7 138-4FA04-0AB0                            |                                                  |
|------------------------------------------------|--------------------------------------------------|
| <b>Standards, approvals, certificates</b>      |                                                  |
| Highest safety class achievable in safety mode |                                                  |
| • acc. to EN 954                               | Cat. 3 (single-channel),<br>Cat. 4 (two-channel) |
| • acc. to IEC 61508                            | SIL 2 (single-channel),<br>SIL 3 (two-channel)   |
| <b>Dimensions and weight</b>                   |                                                  |
| Dimensions                                     |                                                  |
| • Width                                        | 30 mm                                            |
| • Height                                       | 81 mm                                            |
| • Depth                                        | 52 mm                                            |
| Weight                                         |                                                  |
| • Weight, approx.                              | 78 g                                             |

| 6ES7 138-4FB03-0AB0                                     |                                                                                                       |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                                  |                                                                                                       |
| Load voltage L+                                         |                                                                                                       |
| • Rated value (DC)                                      | 24 V                                                                                                  |
| • Reverse polarity protection                           | No                                                                                                    |
| <b>Current consumption</b>                              |                                                                                                       |
| from load voltage L+ (without load), max.               | typ. 100 mA                                                                                           |
| from backplane bus 3.3 V DC, max.                       | 28 mA                                                                                                 |
| <b>Power losses</b>                                     |                                                                                                       |
| Power loss, typ.                                        | 3.5 W                                                                                                 |
| <b>Digital outputs</b>                                  |                                                                                                       |
| Number of digital outputs                               | 4                                                                                                     |
| Short-circuit protection                                | Yes; electronic                                                                                       |
| Limitation of inductive shutdown voltage to             | Typ. (2L+) -47 V                                                                                      |
| Lamp load, max.                                         | 10 W                                                                                                  |
| Controlling a digital input                             | No                                                                                                    |
| Output voltage                                          |                                                                                                       |
| • for signal "1", min.                                  | L+ (-2.0 V), current sourcing switch: L+ (-1.5 V), voltage drop on current sinking switch: max. 0.5 V |
| Output current                                          |                                                                                                       |
| • for signal "1" rated value                            | 2 A                                                                                                   |
| • for signal "1" permissible range for 0 to 60 °C, min. | 20 mA                                                                                                 |
| • for signal "1" permissible range for 0 to 60 °C, max. | 2.4 A                                                                                                 |
| • for signal "0" residual current, max.                 | 0.5 mA; Current sourcing switch: max. 0.5 mA; current sinking switch: max. 4 mA                       |
| Parallel switching of 2 outputs                         |                                                                                                       |
| • for increased power                                   | No                                                                                                    |
| • for redundant control of a load                       | No                                                                                                    |
| Switching frequency                                     |                                                                                                       |
| • with resistive load, max.                             | 30 Hz                                                                                                 |
| • with inductive load, max.                             | 0.1 Hz                                                                                                |
| • on lamp load, max.                                    | 10 Hz                                                                                                 |

| 6ES7 138-4FB03-0AB0                                  |           |
|------------------------------------------------------|-----------|
| Aggregate current of outputs (per group)             |           |
| • horizontal installation                            |           |
| - up to 40 °C, max.                                  | 6 A       |
| - up to 55 °C, max.                                  | 5 A       |
| - up to 60 °C, max.                                  | 4 A       |
| • vertical installation                              |           |
| - up to 40 °C, max.                                  | 4 A       |
| Load resistance range                                |           |
| • lower limit                                        | 12 Ω      |
| • upper limit                                        | 1 kΩ      |
| Cable length                                         |           |
| • Cable length, shielded, max.                       | 200 m     |
| • Cable length unshielded, max.                      | 200 m     |
| <b>Alarms/diagnostics/status information</b>         |           |
| Diagnostics                                          |           |
| • Diagnostic functions                               | Yes       |
| • Wire break                                         | Yes       |
| • Short circuit                                      | Yes       |
| diagnostic indication LED                            |           |
| • Group error SF (red)                               | Yes       |
| • Status indicator digital output (green)            | Yes       |
| <b>Isolation</b>                                     |           |
| Isolation checked with                               | 500 V DC  |
| checked with                                         |           |
| • Channels against backplane bus and load voltage L+ | 1500 V AC |
| <b>Galvanic isolation</b>                            |           |
| Galvanic isolation digital outputs                   |           |
| • between the channels                               | No        |
| • between the channels and the backplane bus         | Yes       |
| • between the channels and the load voltage L+       | No        |

## Technical specifications (continued)

| 6ES7 138-4FB03-0AB0                            |        |
|------------------------------------------------|--------|
| <b>Standards, approvals, certificates</b>      |        |
| Highest safety class achievable in safety mode |        |
| • acc. to EN 954                               | Cat. 4 |
| • acc. to IEC 61508                            | SIL 3  |
| <b>Dimensions and weight</b>                   |        |
| Dimensions                                     |        |
| • Width                                        | 30 mm  |
| • Height                                       | 81 mm  |
| • Depth                                        | 52 mm  |
| Weight                                         |        |
| • Weight, approx.                              | 85 g   |

| Ordering data                                                                                                                                                              | Order No.                          |                                                                                                                                                                                                                                                         | Order No.                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>4/8 F-DI electronic module PROFIsafe 24 V DC</b>                                                                                                                        | <b>6ES7 138-4FA04-0AB0</b>         | <b>Distributed Safety V5.4 programming tool</b>                                                                                                                                                                                                         |                            |
| 30 mm construction width, up to Category 4 (EN954-1)                                                                                                                       |                                    | Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S                                                                                                                                                            |                            |
| <b>4 F-DO electronic module PROFIsafe 24 V DC/2A</b>                                                                                                                       | <b>6ES7 138-4FB03-0AB0</b>         | Requirements: STEP 7 V5.3 SP3 and higher                                                                                                                                                                                                                |                            |
| 30 mm construction width, up to Category 4 (EN954-1)                                                                                                                       |                                    | <b>Floating license</b>                                                                                                                                                                                                                                 | <b>6ES7 833-1FC02-0YA5</b> |
| <b>4 F-DI / 3 F-DO electronic module PROFIsafe 24 V DC/2A</b>                                                                                                              | <b>6ES7 138-4FC01-0AB0</b>         | <b>Software Update Service</b>                                                                                                                                                                                                                          | <b>6ES7 833-1FC00-0YX2</b> |
| 30 mm construction width, up to Category 3 (EN954-1) / SIL 2 (IEC 62061)                                                                                                   |                                    | <b>Distributed Safety Upgrade</b>                                                                                                                                                                                                                       | <b>6ES7 833-1FC02-0YE5</b> |
| <b>Accessories</b>                                                                                                                                                         |                                    | from V5.x to V5.3; Floating license for 1 user                                                                                                                                                                                                          |                            |
| <b>Terminal modules for electronic modules</b>                                                                                                                             | See F terminal modules, page 9/134 | <b>SIMATIC Manual Collection</b>                                                                                                                                                                                                                        | <b>6ES7 998-8XC01-8YE0</b> |
| <b>IM 151-1 High Feature interface module</b>                                                                                                                              | <b>6ES7 151-1BA02-0AB0</b>         | Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication) |                            |
| for ET 200S; transmission rate up to 12 Mbit/s; max. 63 modules can be connected, with isochronous mode, bus connection via 9-pin Sub-D connector incl. terminating module |                                    | <b>SIMATIC Manual Collection – Update service for 1 year</b>                                                                                                                                                                                            | <b>6ES7 998-8XC01-8YE2</b> |
| <b>IM 151-3 PN HF interface module</b>                                                                                                                                     | <b>6ES7 151-3BA23-0AB0</b>         | Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates                                                                                                                                                                  |                            |
| for ET 200S; transfer rate up to 100 Mbit/s; max. 63 I/O modules up to 2 m wide can be connected; 2 x bus connection via RJ45 connector, incl. terminating module          |                                    |                                                                                                                                                                                                                                                         |                            |
| <b>IM 151-3 PN FO interface module</b>                                                                                                                                     | <b>6ES7 151-3BB23-0AB0</b>         |                                                                                                                                                                                                                                                         |                            |
| for ET 200S; 2 PROFINET FO interfaces, integrated 2-port switch, max. 63 I/O modules up to 2 m wide can be connected, incl. terminating module                             |                                    |                                                                                                                                                                                                                                                         |                            |

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# SIMATIC ET 200 distributed I/O

## ET 200S

### Fail-safe I/O modules F electronic module relays

#### Overview



The digital electronic module 1 F-RO 24 V DC/5A 24 ... 230 V AC/5A has the following characteristics

- 1 relay output (2 NO contacts)
- Output current 5 A
- Rated load voltage 24 V DC and 24 to 230 V AC
- The control circuit of the two safety relays must be routed from the outside to the respective terminals.

The attainable safety integrity level is SIL3 (IEC61508), when the control of the F-RO module is implemented via a fail-safe output (e.g. EM 4F-DO 24 V DC/2A PROFIsafe).

#### Technical specifications

| 6ES7 138-4FR00-0AA0                       |                                                    |
|-------------------------------------------|----------------------------------------------------|
| <b>Supply voltages</b>                    |                                                    |
| Load voltage L+                           |                                                    |
| • Rated value (DC)                        | 24 V; Supply via fail-safe output, e.g. of an F-DO |
| <b>Current consumption</b>                |                                                    |
| from load voltage L+ (without load), max. | 100 mA; from control voltage                       |
| from backplane bus 3.3 V DC, max.         | 10 mA                                              |
| <b>Power losses</b>                       |                                                    |
| Power loss, typ.                          | 2.1 W                                              |
| <b>Address area</b>                       |                                                    |
| Address space per module                  |                                                    |
| • with packing                            | 2 bit                                              |
| • without packing                         | 1 byte                                             |
| <b>Digital inputs</b>                     |                                                    |
| Cable length                              |                                                    |
| • Cable length unshielded, max.           | 10 m; control cable                                |
| <b>Digital outputs</b>                    |                                                    |
| Number of digital outputs                 | 1                                                  |
| Short-circuit protection                  | No; 6 A external fuse of duty category gL/gG       |
| Controlling a digital input               | Yes                                                |
| Output current                            |                                                    |
| • for signal "1" rated value              | 5 A                                                |
| • for signal "1" minimum load current     | 5 mA                                               |
| Switching frequency                       |                                                    |
| • with resistive load, max.               | 2 Hz                                               |
| • with inductive load, max.               | 0.1 Hz                                             |
| Aggregate current of outputs (per group)  |                                                    |
| • horizontal installation                 |                                                    |
| - up to 40 °C, max.                       | 8 A                                                |
| - up to 55 °C, max.                       | 6 A; at 50 °C                                      |
| - up to 60 °C, max.                       | 5 A; up to max. 24.8 V                             |
| • vertical installation                   |                                                    |
| - up to 40 °C, max.                       | 6 A                                                |

| 6ES7 138-4FR00-0AA0                            |                                           |
|------------------------------------------------|-------------------------------------------|
| Cable length                                   |                                           |
| • Cable length, shielded, max.                 | 200 m                                     |
| • Cable length unshielded, max.                | 200 m                                     |
| <b>Relay outputs</b>                           |                                           |
| Switching capacity of contacts                 |                                           |
| • Thermal continuous current, max.             | 5 A                                       |
| <b>Alarms/diagnostics/status information</b>   |                                           |
| diagnostic indication LED                      |                                           |
| • Status indicator digital output (green)      | Yes                                       |
| <b>Galvanic isolation</b>                      |                                           |
| Galvanic isolation digital outputs             |                                           |
| • between the channels                         | Yes                                       |
| • between the channels and the backplane bus   | Yes                                       |
| • between the channels and the load voltage L+ | Yes; between channels and control voltage |
| <b>Standards, approvals, certificates</b>      |                                           |
| Highest safety class achievable in safety mode |                                           |
| • acc. to EN 954                               | to Cat. 4                                 |
| • acc. to IEC 61508                            | up to SIL 3                               |
| <b>Dimensions and weight</b>                   |                                           |
| Dimensions                                     |                                           |
| • Width                                        | 30 mm                                     |
| • Height                                       | 81 mm                                     |
| • Depth                                        | 52 mm                                     |
| Weight                                         |                                           |
| • Weight, approx.                              | 90 g                                      |

| Ordering data                                                                                                                                                                                                                   | Order No.                          | Order No.                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1 F-RO electronic module</b><br>24 V DC/5A 24 ... 230 V AC/5A                                                                                                                                                                | <b>6ES7 138-4FR00-0AA0</b>         |                                                                                                                                                                                                                                                                                                                                 |
| <b>Accessories</b>                                                                                                                                                                                                              |                                    |                                                                                                                                                                                                                                                                                                                                 |
| <b>Terminal modules for electronic modules</b>                                                                                                                                                                                  | See F terminal modules, page 9/134 |                                                                                                                                                                                                                                                                                                                                 |
| <b>IM 151-1 High Feature interface module</b><br><br>for ET 200S; transmission rate up to 12 Mbit/s; max. 63 modules can be connected, with isochronous mode, bus connection via 9-pin Sub-D connector incl. terminating module | <b>6ES7 151-1BA02-0AB0</b>         |                                                                                                                                                                                                                                                                                                                                 |
| <b>IM 151-3 PN HF interface module</b><br><br>for ET 200S; transfer rate up to 100 Mbit/s; max. 63 I/O modules up to 2 m wide can be connected; 2 x bus connection via RJ45 connector, incl. terminating module                 | <b>6ES7 151-3BA23-0AB0</b>         |                                                                                                                                                                                                                                                                                                                                 |
| <b>IM 151-3 PN FO interface module</b><br><br>for ET 200S; 2 PROFINET FO interfaces, integrated 2-port switch, max. 63 I/O modules up to 2 m wide can be connected, incl. terminating module                                    | <b>6ES7 151-3BB23-0AB0</b>         |                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                 |                                    | <b>Distributed Safety V5.4 programming tool</b><br><br>Task: Software for configuring of fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S<br>Requirements: STEP 7 V5.3 SP3 and higher                                                                                                                              |
|                                                                                                                                                                                                                                 |                                    | <b>Floating license</b> <b>6ES7 833-1FC02-0YA5</b>                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                 |                                    | <b>Software Update Service</b> <b>6ES7 833-1FC00-0YX2</b>                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                 |                                    | <b>Distributed Safety Upgrade</b> <b>6ES7 833-1FC02-0YE5</b><br><br>from V5.x to V5.3; Floating license for 1 user                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                 |                                    | <b>SIMATIC Manual Collection</b> J <b>6ES7 998-8XC01-8YE0</b><br><br>Electronic manuals on DVD, multi-language:<br>S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication) |
|                                                                                                                                                                                                                                 |                                    | <b>SIMATIC Manual Collection – Update service for 1 year</b> D <b>6ES7 998-8XC01-8YE2</b><br><br>Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates                                                                                                                                         |

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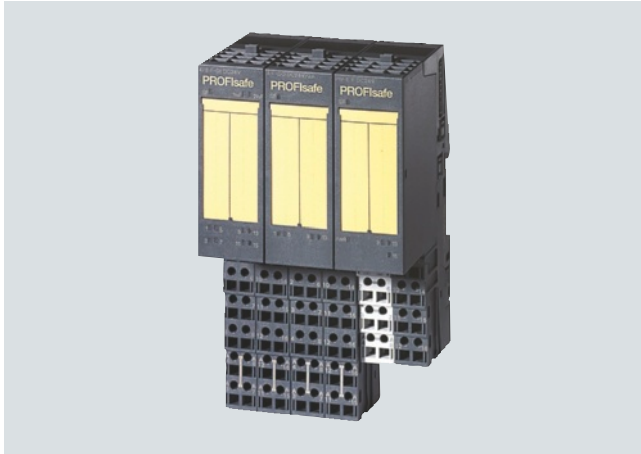
J: Subject to export regulations AL: N and ECCN: EAR99S

## SIMATIC ET 200 distributed I/O

## ET 200S

Fail-safe I/O modules  
F terminal modules

## Overview



- Mechanical modules as receptacles for the electronic modules
- For setting up permanent wiring through self-configuring voltage buses
- Keyed connection technology to ensure an enhanced vibration resistance of up to 5 g
- Different versions to accommodate power modules and electronic modules
- Replaceable terminal box (even within the station network)
- Automatic coding of the electronic modules
- Self-shielding of the backplane bus for high data security
- Color coding facility for the terminals and for identifying the slot numbers
- Alternatively available with screw-type or spring-loaded terminals
- For up to 60 % faster process wiring also with FastConnect connection method (av. soon)

## Ordering data

## Terminal modules for power modules

**TM-P15S23-A1** **6ES7 193-4CC20-0AA0**

Ordering unit 1 unit  
2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals

**TM-P15C23-A1** **6ES7 193-4CC30-0AA0**

Ordering unit 1 unit  
2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

**TM-P15S23-A0** **6ES7 193-4CD20-0AA0**

Ordering unit 1 unit  
2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals

**TM-P15C23-A0** **6ES7 193-4CD30-0AA0**

Ordering unit 1 unit  
2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals

**TM-P15S22-01** **6ES7 193-4CE00-0AA0**

Ordering unit 1 unit  
2 x 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals

**TM-P15C22-01** **6ES7 193-4CE10-0AA0**

Ordering unit 1 unit  
2 x 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

**TM-P30S44-A0** **6ES7 193-4CK20-0AA0**

Ordering unit 1 unit  
7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals for PM-E F PROFIsafe

**TM-P30C44-A0** **6ES7 193-4CK30-0AA0**

Ordering unit 1 unit  
7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals for PM-E F PROFIsafe

| Ordering data                                                                                                                                            | Order No.                  | Ordering data                                                                                                                                                                                                                                                                 | Order No.                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Terminal modules for electronic modules</b>                                                                                                           |                            | <b>Accessories</b>                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                |
| <b>TM-E30S44-01</b><br>Ordering unit 1 unit<br>4 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals    | <b>6ES7 193-4CG20-0AA0</b> | <b>Color coding plates</b><br>Ordering unit 200 units for TM-P, TM-E<br><ul style="list-style-type: none"> <li>• white</li> <li>• yellow</li> <li>• yellow/green</li> <li>• red</li> <li>• blue</li> <li>• brown</li> <li>• turquoise</li> </ul>                              | <b>6ES7 193-4LA20-0AA0</b><br><b>6ES7 193-4LB20-0AA0</b><br><b>6ES7 193-4LC20-0AA0</b><br><b>6ES7 193-4LD20-0AA0</b><br><b>6ES7 193-4LF20-0AA0</b><br><b>6ES7 193-4LG20-0AA0</b><br><b>6ES7 193-4LH20-0AA0</b> |
| <b>TM-E30C44-01</b><br>Ordering unit 1 unit<br>4 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals | <b>6ES7 193-4CG30-0AA0</b> | <b>Grounding terminal</b><br>Ordering unit 1 unit<br>For cable cross-sections up to 25 mm <sup>2</sup>                                                                                                                                                                        | <b>8WA2 868</b>                                                                                                                                                                                                |
| <b>TM-E30S46-A1</b><br>Ordering unit 1 unit<br>4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals       | <b>6ES7 193-4CF40-0AA0</b> | <b>3 x 10 mm busbars</b><br>Ordering unit 1 unit                                                                                                                                                                                                                              | <b>8WA2 842</b>                                                                                                                                                                                                |
| <b>TM-E30C46-A1</b><br>Ordering unit 1 unit<br>4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals    | <b>6ES7 193-4CF50-0AA0</b> | <b>Labels, inscribed</b><br>Ordering unit 1 set<br><ul style="list-style-type: none"> <li>• 200 units for slot numbering (1 to 20) 10 x</li> <li>• 200 units for slot numbering (1 to 40) 5 x</li> <li>• 200 units for slot numbering (1 to 64) 1 x, (1 to 68) 2 x</li> </ul> | <b>8WA8 861-0AB</b><br><b>8WA8 861-0AC</b><br><b>8WA8 861-0DA</b>                                                                                                                                              |
|                                                                                                                                                          |                            | <b>Labels, blank</b><br>200 units for slot numbering                                                                                                                                                                                                                          | <b>8WA8 848-2AY</b>                                                                                                                                                                                            |



## SIMATIC ET 200 distributed I/O

## ET 200S

SIPLUS fail-safe I/O modules  
SIPLUS F electronic modules

## Overview



Digital inputs/outputs for the fail-safe SIMATIC S7 systems

Fail-safe digital input module

- For fail-safe reading of sensor information (1 or 2 channels)

- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 2 internal sensor supplies (incl. test function) onboard

Fail-safe digital output module

- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be controlled up to 2 A

All modules are certified up to Cat. 4 (EN 954-1) and up to SIL 3 (IEC 61508).

The modules support PROFIsafe, both in PROFIBUS and in PROFINET configurations.

They can be used with all fail-safe SIMATIC S7-CPU's.

**Note:**

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

|                           | SIPLUS electronic module 4 F-DO,<br>PROFIsafe 24 V DC/2 A                             | SIPLUS electronic module 4/8 F-DI,<br>PROFIsafe 24 V DC |
|---------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------|
| Order number              | 6AG1 138-4FA04-2AB0                                                                   | 6AG1 138-4FB03-2AB0                                     |
| Order No. based on        | 6ES7 138-4FA04-0AB0                                                                   | 6ES7 138-4FB03-0AB0                                     |
| Ambient temperature range | -25 ... +60 °C                                                                        |                                                         |
| Conformal coating         | Coating of the printed circuit boards and the electronic components                   |                                                         |
| Technical data            | The technical data of the standard product applies except for the ambient conditions. |                                                         |
| Ambient conditions        |                                                                                       |                                                         |
| Relative humidity         | 5 ... 100%, condensation allowed                                                      |                                                         |

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

| Ordering data                                                                                                  | Order No.                    |                                                                                                                  | Order No.                                    |
|----------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>F electronic modules SIPLUS</b><br>(extended temperature range and medial exposure)                         |                              | <b>4 F-DO electronic module, PROFIsafe 24 V DC/2 A,</b><br>30 mm construction width, up to Category 4 (EN 954-1) | <b>6AG1 138-4FB03-2AB0</b>                   |
| <b>4/8 F DI electronic module, PROFIsafe 24 V DC,</b><br>30 mm construction width, up to Category 4 (EN 954-1) | H <b>6AG1 138-4FA04-2AB0</b> | <b>Accessories</b>                                                                                               | See SIMATIC F electronic modules, page 9/131 |

H: Subject to export regulations AL: 9I999 and ECCN: EAR99H

I: Subject to export regulations AL: N and ECCN: EAR99H

**Overview**

The electronic module 4SI IO-Link is an IO-Link master and supports the easy integration of sensors and actuators from different manufacturers in the multifunctional, distributed I/O system SIMATIC ET 200S on a total of four ports.

**Features**

- Up to 4 IO-Link devices can be connected to each IO-Link master module (3-wire connection)
- Up to 4 standard actuators or sensors (2-wire/3-wire connection) can be connected.
- The electronic module 4SI IO-Link is 15 mm in width and can be used with the following universal terminal modules:
  - TM-E15S26-A1 (screw-type terminal)
  - TM-E15C26-A1 (spring-loaded terminal)
  - TM-E15N26-A1 (Fast Connect)
- Supports firmware update (STEP 7 V5.4 SP4 and higher)

**Ordering data****Order No.****4SI electronic module IO-Link****6ES7 138-4GA50-0AB0**

IO-Link master, Screw terminal, spring-loaded terminal or Fast Connect

I: Subject to export regulations AL: N and ECCN: EAR99H

## SIMATIC ET 200 distributed I/O

## ET 200S

IO-Link master modules  
4SI SIRIUS electronic module

## Overview



The electronic module 4SI SIRIUS supports easy, cost-effective connection of SIRIUS switching devices with IO-Link to the multi-functional, distributed I/O system SIMATIC ET 200S on a total of four ports.

## Features

- Up to 4 SIRIUS switching devices (max. 16 for groups of four) can be connected to each IO-Link SIRIUS module using IO-Link (3-wire connection).
- The electronic module 4SI SIRIUS is 15 mm in width and can be used with the following universal terminal modules:
  - TM-E15S26-A1 (screw-type terminal)
  - TM-E15C26-A1 (spring-loaded terminal)
  - TM-E15N26-A1 (Fast Connect)
- Supports firmware update (STEP 7 V5.4 SP5 and higher).

## Ordering data

## Order No.

**4SI SIRIUS electronic module****6RK1 005-0LB00-0AA0**

for connecting SIRIUS switching devices to ET 200S;  
4 ports. Screw terminal, spring-loaded terminal or Fast Connect connection method

## Overview

### ET 200S motor starter in the ET 200S I/O system

The SIMATIC ET 200S is the multifunctional and bit-modular I/O system with degree of protection IP20 and can be precisely adapted to the automation task.

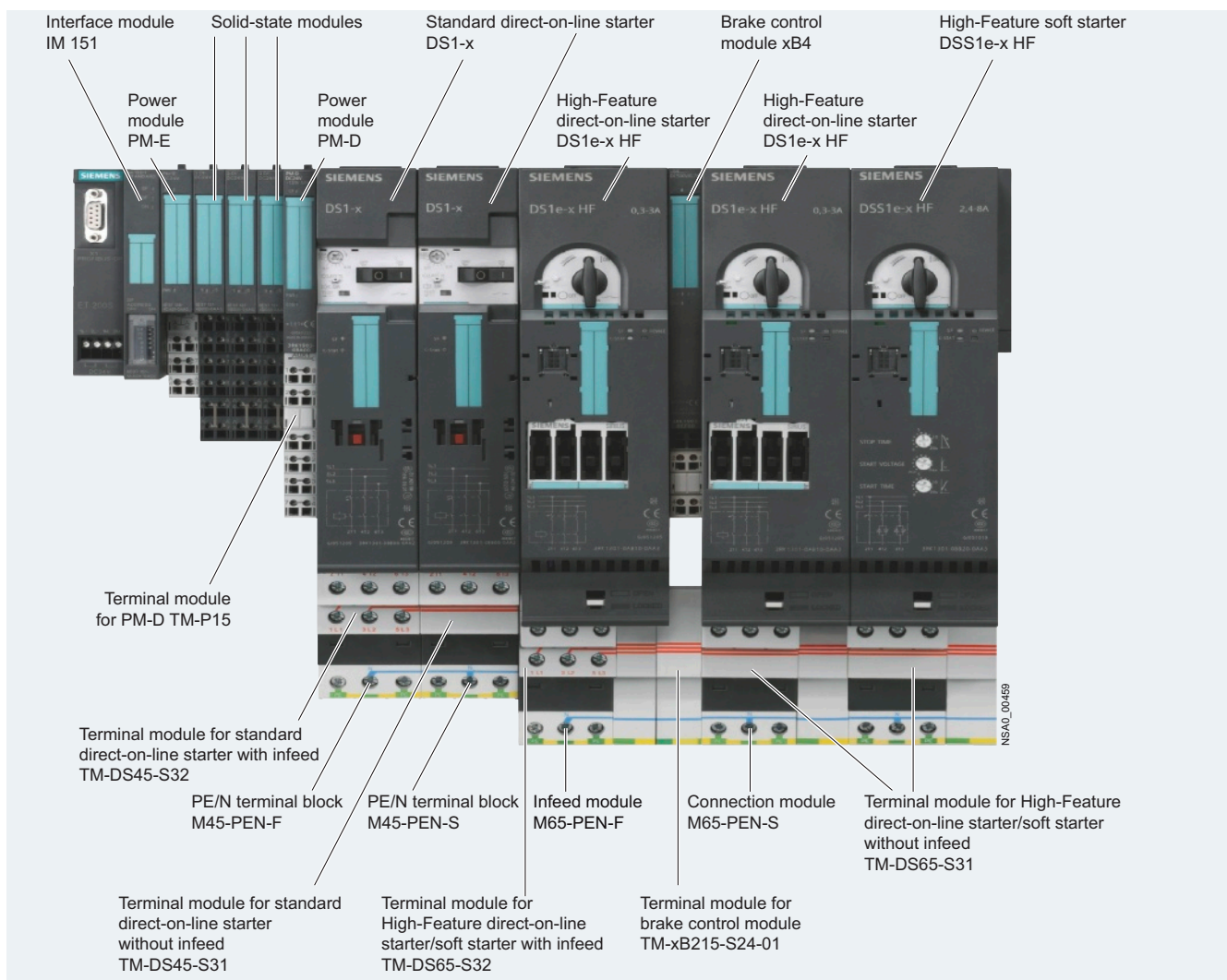
Interface modules (IM) are used for connecting the ET 200S to PROFIBUS DP or PROFINET. If interface modules with integrated S7-CPU are used, the ET 200S can be used as small controller.

The ET 200S can be made up of components from a comprehensive range of digital and analog input or output modules, technology modules, IO-Link master modules, pneumatic connections, or motor starters and frequency converters for the control of drives.

The device can be replaced easily and quickly thanks to permanent wiring and automatic reparameterization. Hot swapping during operation of the plant, i.e. removing and inserting the modules without previous disconnection, in combination with in-depth diagnostic information, guarantees a high availability of the automation system.

The ET 200S motor starters are connected to the controller through the fieldbus, either via PROFIBUS or PROFINET, by means of IM modules which are also available with CPU functionality and parameterized.

The motor starters of the ET 200S can be used to protect and switch any three-phase current loads. Due to the communication interface, they are optimally suited for use in distributed control cabinets or control boxes.



Interaction of the ET 200S motor starter components in the ET 200S I/O system

### Motor starter versions

The ET 200S motor starters are available as direct, reversing or soft starters:

- **Standard motor starter** up to 5.5 kW (direct and reversing starter)
- **High Feature motor starter** up to 7.5 kW (direct, reversing and direct soft starter)

- **Fail-safe motor starter** up to 7.5 kW (direct and reversing starter)
  - Properties of the High Feature motor starter
  - Fail-safe functionality

# SIMATIC ET 200 distributed I/O

## ET 200S

### Motor starters and safety motor starters

#### General data

#### Overview (continued)

##### *Innovation of the ET 200S High Feature motor starters*

The ET 200S High Feature motor starters were completely innovated and now support acyclic services on PROFIBUS and PROFINET, as well as PROFlenergy on PROFINET.

They are now:

- Even more flexible - flexible parameterization
- Integrated in TIA (Totally Integrated Automation) even more
- Even more transparent - due to comprehensive diagnostic data records
- Even more predictive - due to maintenance functions
- Energy-efficient - through PROFlenergy

##### *Basic functionality of the ET 200S motor starters*

All versions of the ET 200S motor starters offer the following functionality. The specific functionality beyond this is described for the respective versions.

- Completely pre-wired motor starters for switching and protecting any three-phase current loads up to 7.5 kW at 400 V AC and 500 V AC
- With self-assembling 40/50 A energy bus, i.e. one-time infeed of load voltage for a group of motors
- All supply voltages are connected only once, i.e. automatically connected to the next module when mounted side-by-side
- Hot swapping is permissible
- Integrated inputs and outputs for control and status signaling
- Control of the motor starter from the controller and of the diagnostic status via cyclic process image
- Diagnostic capability for active monitoring of the switching and protection functions
- The signal states in the process image of the motor starter provide information about protective devices (short circuit or overload), the switching status of contactor(s) or soft starters, and system errors.
- Interface for controlling an expansion module, e.g. Brake Control Modules xB1...xB4 for controlling mechanical brakes in three-phase motors for 24 V DC and 500 V DC.
- Brake Control Module xB5 and xB6 for 400 V AC
- Can be combined with safety technology for use in safety-relevant plant units (IEC 62 061 and ISO 13 849-1)

##### *Mouting*

Since the motor starters are completely pre-wired, up to 80% of the wiring overhead can be saved. The control cabinets can be set up much quicker and require much less space.

Expansions are possible without problems by subsequently adding terminal modules.

Due to their modular terminal design (10 mm<sup>2</sup>), they also replace any previously required marshallng wiring. Due to the permanent wiring and hot swapping function (removing and inserting while energized), a motor starter can be replaced within seconds, if necessary. The motor starters are therefore ideal for use in applications with especially high availability requirements.

##### *Parameterization and configuration*

Configuration is facilitated considerably due to the bit-modular design.

The parts list for each load feeder is reduced to two important positions if the ET 200S motor starters are used: the passive terminal module and the motor starter. The ET 200S is therefore optimally suited for modular machine concepts.

All ET 200S motor starters are set up without fuse protection. Contactors or soft starters are controlled via the integrated outputs. The inputs of the motor starter evaluate the signal states of the protective devices (short circuit or overload), the switching state of contactor(s) or soft starters, and system errors.

The circuit breaker message can be freely parameterized with regard to a group fault message (group faults when circuit breaker is "off"/group fault message when circuit breaker is "off" only when there is an "on" command from the motor starter).

##### *Brake Control Modules and optional digital inputs and outputs*

With one of the optional Brake Control Modules (xB1-xB6), which are arranged to the right next to a motor starter, a mechanical holding brake on a three-phase motor can be activated from the process image of the motor starter.

The Brake Control Modules xB1-xB4 can be used to control both motors with 24 V DC brakes (xB1, xB3) as well as 500 V DC brakes (xB2, xB4).

The xB5 modules (without digital input) and xB6 modules (with two digital inputs) were newly incorporated for activating a mechanical holding brake with a rated operational voltage of 400 V AC. This supports a further motor brake voltage usually found on the market.

The 24 V DC brakes have an external supply and can be vented independently of the switching state of the motor starter. By contrast the 500 V DC brakes mostly have a direct supply from the terminal board of the motor through a rectifier module and therefore cannot be vented when the motor starter is switched off. These brakes cannot be used in combination with the DSS1e-x motor starter (soft starter).

The outputs of the brake control modules can be used alternatively for other purposes, e.g. for controlling DC valves.

With two locally acting inputs optionally available on the brake control modules (xB3, xB4) and another two on the control module of the High-Feature motor starter it is possible to realize autonomous special functions which work independently of the bus and the higher-level control system, e.g. as a quick stop on gate valve controls. In parallel with this, the states of these inputs are signaled to the control system.

##### *Power supply via terminal modules*

The power is supplied via the terminal modules for motor starters:

- The auxiliary voltages are supplied once via the PM-D or PM-DFx power module, which is to be plugged in to the left of the first motor starter.
- The load voltage is supplied at the first (left) TM-xxxxS32 terminal module of a motor starter. The other TM-xxxxS31 terminal modules are automatically supplied with power via the integrated energy bus when they are added. If the energy bus is fully utilized with 40 A for the Standard motor starter or 50 A for the High Feature motor starter, a new infeed must be set up via another TM-xxxxS32 terminal module.

**Overview** (continued)**TM-DS and TM-RS terminal modules for motor starters**

- Mechanical modules in which the motor starter and expansion modules are inserted
- For constructing the permanent wiring and self-assembling voltage bus
- For connecting the motor connection cables
- Positive-locking connection to ensure enhanced vibration resistance

Terminal modules are purely mechanical components for accommodating the ET 200S peripherals. The self-assembling voltage buses integrated in the terminal modules reduce wiring outlay to the single infeed. All modules following on the right are automatically supplied upon plugging the terminal modules together. The robust design and keyed connection technology enables use in harsh industrial conditions.

The TM-DS and TM-RS terminal modules are available in various versions for the Standard motor starters and the High-Feature motor starters.

**The terminal modules with the suffix "-S32"**

- The terminal modules with the suffix "-S32" have connection terminals for feeding into the integrated 40 A/50 A power bus and connection terminals for the motor connection cable. They are mounted at the beginning (left) of a power bus segment.
- An "-S32" terminal module is plugged in to set up a new load group.
- Three caps for sealing the energy bus contacts on the last terminal module of a segment are included in the delivery kit of the "-S32" terminal modules.
- Optionally expandable with PE/N blocks

**The terminal modules with the suffix "-S31"**

- The terminal modules with the suffix "-S31" have only connection terminals for the motor connection cable. These terminal modules follow on the right after a "-S32" terminal module.
- Optionally expandable with PE/N modules

All connecting terminals of the terminal modules for motor starters are equipped with 10 mm<sup>2</sup> screw-type terminals.

**Power module** (page 9/152)

PM-D power modules are used for monitoring the two 24 V DC auxiliary voltages for the group of motor starters following on the right or for supplying power to the group of frequency converters following on the right.

**TM-P terminal module for PM-D power module** (page 9/153)

- Connection by means of screw terminals
- Light colored enclosure for visual distinction
- Always before the first TM-DS/TM-RS

**ET 200S safety motor starter with integrated safety technology**

The safety-oriented, communication-capable ET 200S motor starters offer a suitable solution for any safety application. The portfolio ranges from a simple local safety solution to the user-friendly version with PROFIsafe, which can be used in combination with a safe controller (see [Safety Module local and PROFIsafe](#), page 9/157).

The safety technology is an integral and thus pre-wired component.

The ET 200S Safety motor starters Solutions comprise:

- Safety modules (page 9/158)
- Standard motor starters (page 9/145)
- High-Feature motor starters (page 9/148)
- Fail-safe motor starters (page 9/154)

**System configuration with ET 200S motor starters**

When setting up an ET 200S station with motor starters, a distinction can be made between the following configurations:

- Conventional ET 200S motor starter solution, comprising:
  - PM-D module
  - Standard motor starter or High Feature motor starter
- ET 200S safety motor starter solution, local (see page 9/157)
- ET 200S safety motor starter solutions, PROFIsafe (see page 9/161)

**SIRIUS Motor Starter Block Library for SIMATIC PCS 7**

With the SIRIUS motor starter PCS 7 block library, SIRIUS ET 200S motor starters (direct and reversing starters, direct-on-line soft starters) can be easily and simply integrated into the SIMATIC PCS 7 process control system. The SIRIUS motor starter PCS 7 block library contains the diagnostics and driver blocks corresponding to the SIMATIC PCS 7 diagnostics and driver concept as well as the elements (symbols and faceplates) required for operator control and process monitoring. See catalog IC 10 Chapter 12 "Parametrization, Configuration and Visualization with SIRIUS".

**Configuration tool for ET 200S station**

The "SIMATIC Selection Tool" permits the quick and targeted selection of SIMATIC hardware. It is available for free as configurator in the Siemens Industry Mall. Configure your stations (e.g. S7-1200, S7-300, S7-400, S7-400H) and select the desired distributed I/O (e.g. ET 200S, ET 200pro). Transfer the parts list you received to the shopping cart of the Industry Mall and use it to place orders quickly, conveniently and without errors.

Detailed information on the ET200S system can be found at:

[www.siemens.com/ET200S](http://www.siemens.com/ET200S)

There you will also find a link to the SIMATIC Selection Tool.



# SIMATIC ET 200 distributed I/O

## ET 200S

### Motor starters and safety motor starters

#### General data

#### Overview (continued)



**SIMATIC ET 200S**  
Standard motor starter



**SIMATIC ET 200S**  
High Feature motor starter<sup>1)</sup>

#### Device functions (firmware features)

##### Slave on the bus

Fieldbus ✓ Depends on interface module

##### Parameter assignment

PROFIBUS/PROFINET data sets -- ✓

Parameter assignment via data set start-up -- ✓

##### Diagnostics

Acyclic using data sets -- ✓

Diagnostic interrupt support ✓

Diagnostics via PROFIBUS/PROFINET -- ✓ [See manual](#)

##### Process image

Process image ✓ 3I/3O

✓ 16I/7O

Required address space per module ✓ 4 bit

✓ 2 byte

##### Data channels

Manual mode local interface -- ✓ Through module

Motor Starter ES via local interface -- ✓ From end of 2011

Motor Starter ES via bus -- ✓ From end of 2011

##### Data sets (acyclic)

Parameter assignment -- ✓

Support of PROFIenergy profile -- ✓ Measurement of motor current and tripping during idle times

Diagnostics -- ✓

Measured values -- ✓

Statistics -- ✓

Commands -- ✓

Min/max pointer -- ✓

Logbook -- ✓

Device identification -- ✓

I&M data -- ✓

##### Inputs

Quantity ✓ Maximum 2, via xB3, xB4, xB6

✓ Maximum 4, 2 via xB3, xB4, xB6 and 2 via module 2DI 24 V DC COM

• of which in process image -- ✓ 4

Input action ✓ End position CCW, CW

✓ Parameterizable: flexible

Quick stop -- ✓ Parameterizable

##### Outputs

Quantity ✓ Internal, for controlling brake control module

Output action ✓ Brake

##### Brake output with add-on module

Motor brake voltage brake control module ✓ 24 V DC: xB1/xB3, 500 V DC: xB2/xB4, 400 V AC: xB5/xB6

##### Motor protection

Overload protection ✓ Thermal, range 1:1.3

✓ Electronic, wide range 1:10

Overload warning -- Only tripping

✓

Short-circuit protection ✓ Circuit breaker

✓

Full motor protection --

Motor protection, response to thermal motor model overload --

✓ Parameterizable: Tripping without restart, tripping with restart, warning

Automatic reset --

Temperature sensor --

Emergency start function -- (✓ with Control Unit 3RK1 903-0CG00)

✓

✓ Function available; -- Function not available.

<sup>1)</sup> The specified device functions are only completely applicable for the innovative .-0AB4 starters.

## Overview (continued)



**SIMATIC ET 200S**  
Standard motor starter



**SIMATIC ET 200S**  
High Feature motor starter<sup>1)</sup>

## Device functions (firmware features)

## Device function

|                                                  |                 |                                                                                                                             |
|--------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------|
| Disconnecting means                              | ✓ Rocker switch | ✓ Circuit breaker                                                                                                           |
| Circuit breaker message                          | ✓               | ✓ Parameterizable                                                                                                           |
| Current limit monitoring, lower                  | --              | ✓ Parameterizable, increment 3.125 %, 18.75 ... 100 %                                                                       |
| Current limit monitoring, upper                  | --              | ✓ Parameterizable, increment 3.125 %, 50 ... 150 % (400% for the new -0AB4 starters)                                        |
| Zero-current detection                           | --              | ✓ Parameterizable: warning, trip                                                                                            |
| Blocking protection/tripping of blocking current | --              | ✓ Parameterizable                                                                                                           |
| Asymmetry                                        | ✓               | ✓ Parameterizable: warning, trip                                                                                            |
| Load type                                        | --              | ✓ Parameterizable: 1-phase and 3-phase                                                                                      |
| Tripping class                                   | ✓ CLASS 10      | ✓ Parameterizable (via Motorstarter ES, DS) for DS1e-x and RS1e-x: Class 5 (10A), 10, 15, 20 for DSS1e-x: Class 5 (10A), 10 |
| Protection against voltage failure               | ✓               | ✓ Parameterizable: activated / deactivated                                                                                  |

## Local diagnostic functions via LEDs

|                          |                         |                         |
|--------------------------|-------------------------|-------------------------|
| "C-STAT" switching state | ✓ Red/green/yellow LEDs |                         |
| Group error "GE"         | ✓ Red LEDs              |                         |
| "DEVICE" status          | --                      | ✓ Red/green/yellow LEDs |

## Auxiliary switch for enabling circuit of ET 200S – Safety engineering already integrated

(Use up to SIL 3 (IEC 61 508) or up to category 4 (DIN EN ISO 13 849-1))

|                              |                                                                       |
|------------------------------|-----------------------------------------------------------------------|
| -- Fail-safe kit is required | <sup>3</sup> Apart from DSS1e-x (for this max. category 1 achievable) |
|------------------------------|-----------------------------------------------------------------------|

✓ Function available; -- Function not available

<sup>1)</sup> The specified device functions are only completely applicable for the innovative -0AB4 starters.

|                                             | ET 200S Standard motor starter<br>DS1-x, RS1-x | ET 200S High Feature motor starter<br>DS1e-x, RS1e-x | DSS1e-x                                                   |
|---------------------------------------------|------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------|
| <b>Device functions (firmware features)</b> |                                                |                                                      |                                                           |
| <b>Control function soft starter</b>        |                                                |                                                      |                                                           |
| Soft start function                         | --                                             |                                                      | ✓                                                         |
| Bypass function                             | --                                             |                                                      |                                                           |
| Starting time                               | --                                             |                                                      | ✓ Locally adjustable, not via bus<br>0 ... 20 s           |
| Stopping time                               | --                                             |                                                      | ✓ Locally adjustable, not via bus<br>0 ... 20 s           |
| Stopping mode                               | --                                             |                                                      | ✓ Locally adjustable, not via bus                         |
| Start voltage                               | --                                             |                                                      | ✓ Locally adjustable, not via bus<br>30 ... 100% of $U_g$ |
| Stop voltage                                | --                                             |                                                      | ✓ Locally adjustable, not via bus                         |
| Trace                                       | --                                             |                                                      |                                                           |

✓ Function available; -- Function not available



## SIMATIC ET 200 distributed I/O

## ET 200S

Motor starters and safety motor starters  
General data

## Technical specifications

|                                                                                                                                |                          | Standard motor starters<br>DS1-x, RS1-x                                                             | High Feature motor starters<br>DS1e-x, RS1e-x |                                                                         | DSS1e-x                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Mechanics and environment                                                                                                      |                          |                                                                                                     |                                               |                                                                         |                                                                                                            |
| Motor starters for connection to ET 200S, max. <sup>1)</sup>                                                                   |                          | 42                                                                                                  | 17                                            |                                                                         |                                                                                                            |
| Mounting dimensions (W x H x D)                                                                                                |                          |                                                                                                     |                                               |                                                                         |                                                                                                            |
| • Direct-on-line starters                                                                                                      | mm                       | 45 x (265 + 45) x (120 + 27);<br>(45: PE/N module; 27: Auxil.<br>switch contactor from F-Kit)       |                                               | 65 x (290 + 45) x (150 + 23);<br>(45: PE/N module; 23: Control module)  |                                                                                                            |
| • Reversing starters                                                                                                           | mm                       | 90 x (265 + 45) x (120 + 27);<br>(45: PE/N module; 27: Aux.<br>switch contactor from F-Kit)         |                                               | 130 x (290 + 45) x (150 + 23);<br>(45: PE/N module; 23: Control module) |                                                                                                            |
| Permissible ambient temperature                                                                                                |                          |                                                                                                     |                                               |                                                                         |                                                                                                            |
| • During operation                                                                                                             | °C                       | 0 ... +60, from +40 with derat-<br>ing                                                              |                                               | 0 ... +60 with horizontal mounting up to +40                            |                                                                                                            |
| • During storage                                                                                                               | °C                       | -40 ... +70                                                                                         |                                               | -40 ... +70                                                             |                                                                                                            |
| • Permissible mounting positions                                                                                               | °C                       | Vertical, horizontal<br>with derating                                                               |                                               | Vertical, horizontal                                                    |                                                                                                            |
| Weight                                                                                                                         |                          |                                                                                                     |                                               |                                                                         |                                                                                                            |
| • Direct-on-line/reversing starter incl. terminal module                                                                       | kg                       | 1.0/1.6                                                                                             |                                               | 1.6/2.2                                                                 | 1                                                                                                          |
| • Direct-on-line/reversing starter incl. terminal block PE/N                                                                   |                          | 1.1/1.8                                                                                             |                                               | 1.7/2.3                                                                 | 1.1                                                                                                        |
| Vibration resistance acc. to IEC 60068, Part 2-6                                                                               |                          | g                                                                                                   | 2                                             |                                                                         |                                                                                                            |
| Shock resistance acc. to IEC 60068, Part 2-27                                                                                  |                          | g/ms                                                                                                | Square 5/11                                   |                                                                         |                                                                                                            |
| Conductor cross-section                                                                                                        |                          |                                                                                                     |                                               |                                                                         |                                                                                                            |
| • Solid                                                                                                                        | mm <sup>2</sup>          | 2 x (1 ... 2.5) <sup>2)</sup> ; 2 x (2.5 ... 6) <sup>2)</sup> , according to IEC 60947: max. 1 x 10 |                                               |                                                                         |                                                                                                            |
| • Finely stranded with end sleeve                                                                                              | mm <sup>2</sup>          | 2 x (1 ... 2.5) <sup>2)</sup> ; 2 x (2.5 ... 6) <sup>2)</sup>                                       |                                               |                                                                         |                                                                                                            |
| • AWG cables, solid or stranded                                                                                                | AWG                      | 2 x (14 ...10)                                                                                      |                                               |                                                                         |                                                                                                            |
| Degree of protection                                                                                                           |                          | IP20, finger-safe (this also applies to terminal modules on a dismantled motor starter)             |                                               |                                                                         |                                                                                                            |
| Mechanical endurance                                                                                                           |                          |                                                                                                     |                                               |                                                                         |                                                                                                            |
| • Motor starter protectors                                                                                                     | Oper-<br>ating<br>cycles | 100 000                                                                                             |                                               |                                                                         |                                                                                                            |
| • Contactor                                                                                                                    |                          | 30 million                                                                                          | 10 million                                    | --                                                                      |                                                                                                            |
| • Contactor with safety functionality (F-Kit)                                                                                  |                          | 10 million                                                                                          | --                                            | --                                                                      |                                                                                                            |
| Electrical specifications                                                                                                      |                          |                                                                                                     |                                               |                                                                         |                                                                                                            |
| Power consumption                                                                                                              |                          |                                                                                                     |                                               |                                                                         |                                                                                                            |
| • From auxiliary circuit L+/M (U <sub>1</sub> )                                                                                | mA                       | Approx. 20                                                                                          |                                               | Approx. 40                                                              |                                                                                                            |
| • From auxiliary circuit A1/A2 (U <sub>2</sub> )                                                                               | mA                       | Approx. 100                                                                                         |                                               | Approx. 1 700 (80 ms long),<br>approx. 350 (after 80 ms)                |                                                                                                            |
| Rated operational current for TM-D terminal modules I <sub>e</sub>                                                             |                          | A                                                                                                   | 40                                            | 50                                                                      |                                                                                                            |
| Rated operational voltage U <sub>e</sub>                                                                                       |                          | V                                                                                                   | 400                                           |                                                                         |                                                                                                            |
| Approval to VDE 0106 Part 101                                                                                                  |                          | V                                                                                                   | Yes, up to 500                                |                                                                         | Yes, up to 480                                                                                             |
| CSA and U <sub>L</sub> approval                                                                                                |                          | V                                                                                                   | Yes, up to 600                                |                                                                         | Yes, up to 480                                                                                             |
| Rated operational current I <sub>e</sub> for motor starters                                                                    |                          |                                                                                                     |                                               |                                                                         |                                                                                                            |
| • AC-1/2/3 at 60 °C<br>- At 400 V<br>- At 500 V                                                                                | A                        | 12                                                                                                  | 16                                            | 3 / 8 / 16                                                              |                                                                                                            |
|                                                                                                                                | A                        | 9                                                                                                   | 11                                            | --                                                                      |                                                                                                            |
| • AC-4 at 60 °C<br>- At 400 V                                                                                                  | A                        | 4,1                                                                                                 | 9                                             | --                                                                      |                                                                                                            |
|                                                                                                                                |                          |                                                                                                     |                                               |                                                                         |                                                                                                            |
| Rated short-circuit breaking capacity                                                                                          |                          | kA                                                                                                  | 50 at 400 V                                   |                                                                         |                                                                                                            |
| Power of induction motors at 500 V                                                                                             |                          | kW                                                                                                  | 5.5                                           | 7.5                                                                     |                                                                                                            |
| Utilization categories                                                                                                         |                          | AC-1, AC-2, AC-3, AC-4                                                                              |                                               |                                                                         |                                                                                                            |
| Protective separation between main and auxiliary circuits                                                                      |                          | V                                                                                                   | 400, acc. to VDE 0106, Part 101               |                                                                         |                                                                                                            |
| Positively-driven operation of contactor relay (NC)                                                                            |                          | Yes                                                                                                 |                                               |                                                                         | --                                                                                                         |
| Trip class                                                                                                                     |                          | CLASS 10                                                                                            |                                               | CLASS 10/20, can be<br>parameterized                                    | 0.3 ... 3 A:<br>CLASS 10/10A, can be<br>parameterized<br>2.4 ... 8 A: CLASS 10A<br>2.4 ... 16 A: CLASS 10A |
| Type of coordination                                                                                                           |                          | Up to 1.6 A: 2 / Up to 12 A: 1                                                                      |                                               | Up to 16 A: 2                                                           | Up to 16 A: 1                                                                                              |
| Electrical endurance                                                                                                           |                          |                                                                                                     |                                               |                                                                         |                                                                                                            |
| • Motor starter protector                                                                                                      | h                        | 100 000                                                                                             |                                               |                                                                         |                                                                                                            |
| • Contactor                                                                                                                    |                          | <a href="#">See manual</a>                                                                          |                                               |                                                                         | --                                                                                                         |
| Permissible switching frequency with a starting time<br>t <sub>A</sub> = 0.1 s and a relative ON period t <sub>OP</sub> = 50 % |                          | 1/h                                                                                                 | < 80                                          | <a href="#">See manual</a>                                              |                                                                                                            |
| Induction protection                                                                                                           |                          | Already installed                                                                                   |                                               |                                                                         |                                                                                                            |

<sup>1)</sup> Additional limits: Process image, max. design width 2 m.

<sup>2)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.  
If identical cross-sections are used, this restriction does not apply.

## Overview

### Functionality of the Standard motor starters

- For basic functionality, see ET 200S Motor Starter and Safety Motor Starter, General Data, Overview, page 9/140
- Direct and reversing starter up to 5.5 kW
- Energy bus up to 40 A
- With circuit breaker/contact assembly
- Integrated disconnect functions via circuit breakers
- Can be combined with local safety technology for use in safety-relevant plant units with fail-safe kit and PM-D F modules (see Accessories, page 9/169)

### Device functions (Firmware Features)

See Motor starters and safety motor starters ET 200S, General data, Overview, page 9/142.

## Technical specifications

See Motor starters and safety motor starters ET 200S, General data, page 9/144.

## Ordering data

|                                                                                                                     | Induction motor 4-pole at 400 V AC, standard output <i>P</i><br>kW | Setting range of the electronic release<br>A | Order No.             |
|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------|-----------------------|
| <b>Standard motor starters, with diagnostics, electromechanical, fuseless, expandable with brake control module</b> |                                                                    |                                              |                       |
| <i>DS1-x direct-on-line starters</i>                                                                                |                                                                    |                                              |                       |
| <br>DS1-x                         | < 0.06                                                             | 0.14 ... 0.20                                | F 3RK1 301-0BB00-0AA2 |
|                                                                                                                     | 0.06                                                               | 0.18 ... 0.25                                | F 3RK1 301-0CB00-0AA2 |
|                                                                                                                     | 0.09                                                               | 0.22 ... 0.32                                | F 3RK1 301-0DB00-0AA2 |
|                                                                                                                     | 0.10                                                               | 0.28 ... 0.40                                | F 3RK1 301-0EB00-0AA2 |
|                                                                                                                     | 0.12                                                               | 0.35 ... 0.50                                | F 3RK1 301-0FB00-0AA2 |
|                                                                                                                     | 0.18                                                               | 0.45 ... 0.63                                | F 3RK1 301-0GB00-0AA2 |
|                                                                                                                     | 0.21                                                               | 0.55 ... 0.80                                | F 3RK1 301-0HB00-0AA2 |
|                                                                                                                     | 0.25                                                               | 0.70 ... 1.00                                | F 3RK1 301-0JB00-0AA2 |
|                                                                                                                     | 0.37                                                               | 0.90 ... 1.25                                | F 3RK1 301-0KB00-0AA2 |
|                                                                                                                     | 0.55                                                               | 1.1 ... 1.6                                  | F 3RK1 301-1AB00-0AA2 |
|                                                                                                                     | 0.75                                                               | 1.4 ... 2.0                                  | F 3RK1 301-1BB00-0AA2 |
|                                                                                                                     | 0.90                                                               | 1.8 ... 2.5                                  | F 3RK1 301-1CB00-0AA2 |
|                                                                                                                     | 1.1                                                                | 2.2 ... 3.2                                  | F 3RK1 301-1DB00-0AA2 |
|                                                                                                                     | 1.5                                                                | 2.8 ... 4.0                                  | F 3RK1 301-1EB00-0AA2 |
|                                                                                                                     | 1.9                                                                | 3.5 ... 5.0                                  | F 3RK1 301-1FB00-0AA2 |
|                                                                                                                     | 2.2                                                                | 4.5 ... 6.3                                  | F 3RK1 301-1GB00-0AA2 |
|                                                                                                                     | 3.0                                                                | 5.5 ... 8.0                                  | F 3RK1 301-1HB00-0AA2 |
|                                                                                                                     | 4.0                                                                | 7 ... 10                                     | F 3RK1 301-1JB00-0AA2 |
|                                                                                                                     | 5.5                                                                | 9 ... 12                                     | F 3RK1 301-1KB00-0AA2 |
| <i>RS1-x reversing starters</i>                                                                                     |                                                                    |                                              |                       |
| <br>RS1-x                        | < 0.06                                                             | 0.14 ... 0.20                                | F 3RK1 301-0BB00-1AA2 |
|                                                                                                                     | 0.06                                                               | 0.18 ... 0.25                                | F 3RK1 301-0CB00-1AA2 |
|                                                                                                                     | 0.09                                                               | 0.22 ... 0.32                                | F 3RK1 301-0DB00-1AA2 |
|                                                                                                                     | 0.10                                                               | 0.28 ... 0.40                                | F 3RK1 301-0EB00-1AA2 |
|                                                                                                                     | 0.12                                                               | 0.35 ... 0.50                                | F 3RK1 301-0FB00-1AA2 |
|                                                                                                                     | 0.18                                                               | 0.45 ... 0.63                                | F 3RK1 301-0GB00-1AA2 |
|                                                                                                                     | 0.21                                                               | 0.55 ... 0.80                                | F 3RK1 301-0HB00-1AA2 |
|                                                                                                                     | 0.25                                                               | 0.70 ... 1.00                                | F 3RK1 301-0JB00-1AA2 |
|                                                                                                                     | 0.37                                                               | 0.90 ... 1.25                                | F 3RK1 301-0KB00-1AA2 |
|                                                                                                                     | 0.55                                                               | 1.1 ... 1.6                                  | F 3RK1 301-1AB00-1AA2 |
|                                                                                                                     | 0.75                                                               | 1.4 ... 2.0                                  | F 3RK1 301-1BB00-1AA2 |
|                                                                                                                     | 0.90                                                               | 1.8 ... 2.5                                  | F 3RK1 301-1CB00-1AA2 |
|                                                                                                                     | 1.1                                                                | 2.2 ... 3.2                                  | F 3RK1 301-1DB00-1AA2 |
|                                                                                                                     | 1.5                                                                | 2.8 ... 4.0                                  | F 3RK1 301-1EB00-1AA2 |
|                                                                                                                     | 1.9                                                                | 3.5 ... 5.0                                  | F 3RK1 301-1FB00-1AA2 |
|                                                                                                                     | 2.2                                                                | 4.5 ... 6.3                                  | F 3RK1 301-1GB00-1AA2 |
|                                                                                                                     | 3.0                                                                | 5.5 ... 8.0                                  | F 3RK1 301-1HB00-1AA2 |
|                                                                                                                     | 4.0                                                                | 7 ... 10                                     | F 3RK1 301-1JB00-1AA2 |
|                                                                                                                     | 5.5                                                                | 9 ... 12                                     | F 3RK1 301-1KB00-1AA2 |

F: Subject to export regulations AL: N and ECCN: EAR99

# SIMATIC ET 200 distributed I/O

## ET 200S

### Motor starters and safety motor starters Standard terminal modules

#### Übersicht

##### TM-DS, TM-RS terminal modules

(See also Motor starters and safety motor starters ET 200S, General data, section Terminal modules, Overview, page 9/140)

- "S32" version with supply terminals: 2 x 3 x 10 mm<sup>2</sup> screw terminals for power bus and motor feeder
- "S31" version without supply terminals: 1 x 3 x 10 mm<sup>2</sup> screw terminals for motor feeder
- Optionally expandable with PE/N modules (see Accessories)
- Applies only to Standard motor starters: For applications with high motor currents (> 6.3 A) or high ambient temperatures (> 40 °C) it is recommended to use the DM-V15 distance module (see Accessories) between two DS1-x motor starters

#### Technical specifications

##### TM-DS45 and TM-DS65/TM-FDS65 terminal modules

|                                                                   |                 | TM-DS45                                                                                             | TM-DS65/TM-FDS65 |
|-------------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------|------------------|
| <b>Dimensions</b>                                                 |                 |                                                                                                     |                  |
| • Mounting dimensions (W x H x D)                                 | mm              | 45 x 264 x 100                                                                                      | 65 x 290 x 100   |
| • Height with PE/N terminal block                                 | mm              | 306                                                                                                 | 332              |
| • Depth with motor starter                                        | mm              | 127                                                                                                 | 150              |
| • Depth with motor starter and F-Kit (safety technology)          | mm              | 152                                                                                                 | --               |
| • Depth with motor starter and 2DI control module                 | mm              | --                                                                                                  | 173              |
| <b>Rated voltages, currents and frequencies for the power bus</b> |                 |                                                                                                     |                  |
| • Rated insulation voltage $U_i$                                  | V               | 690                                                                                                 |                  |
| • Rated operational voltage $U_e$                                 | V               | 500 AC                                                                                              |                  |
| • Rated impulse withstand voltage $U_{imp}$                       | kV              | 6                                                                                                   |                  |
| • Rated operational current $I_e$                                 | A               | 40                                                                                                  | 50               |
| • Rated frequency                                                 | Hz              | 50/60                                                                                               |                  |
| <b>Conductor cross-sections</b>                                   |                 |                                                                                                     |                  |
| • Solid                                                           | mm <sup>2</sup> | 2 x (1 ... 2.5) <sup>1)</sup> or<br>2 x (2.5 ... 6) <sup>1)</sup>                                   |                  |
| • Finely stranded with end sleeve                                 | mm <sup>2</sup> | 1 x 10 or<br>2 x (1 ... 2.5) <sup>1)</sup> or<br>2 x (2.5 ... 6) <sup>1)</sup><br>Acc. to IEC 60947 |                  |
| • AWG cables, solid or stranded                                   | AWG             | 2 x (14 ... 10)                                                                                     |                  |
| • With additional three-phase feeder terminal if required         |                 |                                                                                                     |                  |
| - Solid or stranded                                               | mm <sup>2</sup> | 1 x 2.5 ... 25                                                                                      |                  |
| - Finely stranded with end sleeve                                 | mm <sup>2</sup> | 1 x 2.5 ... 25                                                                                      |                  |
| - AWG cables, solid or stranded                                   | AWG             | 1 x 12 ... 4                                                                                        |                  |
| <b>Wiring</b>                                                     |                 |                                                                                                     |                  |
| • Required tool                                                   |                 | Standard screwdriver size 2 and Pozidriv 2                                                          |                  |
| • Tightening torque                                               | Nm              | 2.0 ... 2.5                                                                                         |                  |

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

##### TM-RS90 and TM-RS130/TM-FRS130 terminal module

|                                                                   |    | TM-RS90        | TM-RS130/TM-FRS130 |
|-------------------------------------------------------------------|----|----------------|--------------------|
| <b>Dimensions</b>                                                 |    |                |                    |
| • Mounting dimensions (W x H x D)                                 | mm | 90 x 264 x 100 | 130 x 290 x 100    |
| • Height with PE/N                                                | mm | 306            | 332                |
| • Depth with motor starter                                        | mm | 127            | 150                |
| • Depth with motor starter and F-Kit (safety technology)          | mm | 152            | --                 |
| • Depth with motor starter and 2DI control module                 | mm | --             | 173                |
| <b>Rated voltages, currents and frequencies for the power bus</b> |    |                |                    |
| • Rated insulation voltage $U_i$                                  | V  | 690            |                    |
| • Rated operational voltage $U_e$                                 | V  | 500 AC         |                    |
| • Rated impulse withstand voltage $U_{imp}$                       | kV | 6              |                    |
| • Rated operational current $I_e$                                 | A  | 40             | 50                 |
| • Rated frequency                                                 | Hz | 50/60          |                    |

**Technical specifications** (continued)**TM-RS90 and TM-RS130/TM-FRS130 terminal module**

|                                                           |                 | TM-RS90                                                                                           | TM-RS130/TM-FRS130 |
|-----------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------|--------------------|
| <b>Conductor cross-sections</b>                           |                 |                                                                                                   |                    |
| • Solid                                                   | mm <sup>2</sup> | 2 x (1 ... 2.5) <sup>1)</sup> or 2 x (2.5 ... 6) <sup>1)</sup>                                    |                    |
| • Finely stranded with end sleeve                         | mm <sup>2</sup> | 1 x 10 or<br>2 x (1 ... 2.5 ) <sup>1)</sup> or 2 x (2.5 ... 6) <sup>1)</sup><br>Acc. to IEC 60947 |                    |
| • AWG cables, solid or stranded                           | AWG             | 2 x (14 ... 10)                                                                                   |                    |
| • With additional three-phase feeder terminal if required |                 |                                                                                                   |                    |
| - Solid or stranded                                       | mm <sup>2</sup> | 1 x 2.5 ... 25                                                                                    |                    |
| - Finely stranded with end sleeve                         | mm <sup>2</sup> | 1 x 2.5 ... 25                                                                                    |                    |
| - AWG cables, solid or stranded                           | AWG             | 1 x 12 ... 4                                                                                      |                    |
| <b>Wiring</b>                                             |                 |                                                                                                   |                    |
| • Required tool                                           |                 | Standard screwdriver size 2 and Pozidriv 2                                                        |                    |
| • Tightening torque                                       | Nm              | 2.0 ... 2.5                                                                                       |                    |

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

**Ordering data**

|                                                                                                      |                                                                                                                                                            | Version | Order No.      |
|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|
| <b>Terminal modules for standard motor starters</b>                                                  |                                                                                                                                                            |         |                |
| <br>3RK1 903-0AB00 | <b>TM-DS45-S32</b><br><b>for DS1-x direct-on-line starters</b><br>with incoming power bus connection<br>including three caps for terminating the power bus | F       | 3RK1 903-0AB00 |
|                                                                                                      | <b>TM-DS45-S31</b><br><b>for DS1-x direct-on-line starters</b><br>without incoming power bus connection                                                    |         | 3RK1 903-0AB10 |
|                                                                                                      | <b>TM-RS90-S32</b><br><b>for RS1-x reversing starters</b><br>with incoming power bus connection<br>including three caps for terminating the power bus      |         | 3RK1 903-0AC00 |
|                                                                                                      | <b>TM-RS90-S31</b><br><b>for RS1-x reversing starters</b><br>without incoming power bus connection                                                         | F       | 3RK1 903-0AC10 |

F: Subject to export regulations AL: N and ECCN: EAR99

# SIMATIC ET 200 distributed I/O

## ET 200S

### Motor starters and safety motor starters High Feature motor starter

#### Overview

##### Functionality of the High Feature motor starters

- For basic functionality, see *Motor Starters and Safety Motor Starters ET 200S, General Data, Overview, page 9/140*
- Direct, reversing or soft starter up to 7.5 kW
- Available with wide range and in 3 setting ranges (0.3...3 A, 2.4...8 A, 2.4...16 A)
- With a combination of starter circuit breakers, electronic overload protection (parameterizable), and contactor or soft starter
- Energy bus up to 50 A
- Upper and lower current limits for plant and process monitoring
- Integrated motor blocking protection, residual current detection, and asymmetry detection
- The current motor current is measured and transmitted for diagnostics in the cyclic process image
- Control of the motor starter from the controller and detailed diagnostic status via cyclic process image
- Optional digital inputs available in the cyclic process image and functions can be flexibly assigned so that they can be adapted to any application
- Detection of the switching state of the starter circuit breaker via auxiliary switches and of the switching state of the contactor via a current flow analysis
- Integrated disconnect function via starter circuit breaker
- Local safety equipment possible (for the HF starter without an fail-safe kit, because the function of the fail-safe kit is already integrated)
- 2DI LC COM control module can be plugged in on the front to provide 2 additional parameterizable digital inputs
- Optional "Motor Starter ES" software for user-friendly commissioning and diagnostics - as of 11/2011 also available for the innovated .-0AB4 starters (see page 9/180)
- PROFlenergy capable<sup>1)</sup>
  - Providing the motor current in PROFlenergy-Format
  - Shutdown during idle times
- Support of all acyclic DPV1 services on PROFIBUS and PROFINET<sup>1)</sup>
  - Changing of parameters during operation, e.g. rated operational current parameters
  - Reading and writing of acyclic data for accurate diagnostics of the device and of the system status analysis process

<sup>1)</sup> Only for the innovated .-0AB4 starters

##### Selective protection concept for ET 200S High Feature motor starters

Thanks to the selective protection concept (separate short circuit and overload tripping) with electronic overload analysis, a number of additional advantages are gained with the High Feature motor starters, which quickly pay off especially in production processes with high plant downtime costs:

- Only two versions up to 7.5 kW - thus reducing the ordering and stockkeeping overhead
- All of the settings can be parameterized via the bus - which means full TIA capability
- Separate indication of overload and short circuit - allows selective diagnostics
- Overload can be acknowledged by means of a remote reset - ideal for highly automated plants
- Current asymmetry monitoring - full monitoring of the motor
- Blocking protection - full monitoring of the motor
- Emergency start function in the event of an overload - operability in an emergency
- Current value transmission via bus - monitoring of application

- Current limit monitoring
- Parameterizable trip class - overload tripping can be adapted to application
- Assignment type 2 - still capable of functioning after 50 kA short circuit
- Very long lifespan of contact piece



ET 200S High Feature Motor starter: DS1e-x direct starter (innovated .-0AB4 starter)



ET 200S High Feature motor starter: DSS1e-x (innovated .-0AB4 starter)



ET 200S High Feature motor starter: Reversing starter RS1e-x (innovated .-0AB4 starter)

**Overview** (continued)PROFenergy for ET 200S High Feature motor starter<sup>1)</sup>

Rising energy costs, far-reaching ecological problems around the world, and the looming climate change require a more conscious use of energy.

PROFenergy permits an active and effective energy management.

PROFenergy is a multi-vendor and cross-vendor profile on PROFINET standardized by PI<sup>1)</sup> and supports the shutdown of electronic devices during idle times and the read-out of measured values.

The ET 200S HF motor starter provides the motor current in the PROFenergy format and shuts down during idle times..

<sup>1)</sup> The manufacturer and users of the standardized communication technologies PROFIBUS und PROFINET have joined forces in PI (PROFIBUS International).

Support of the acyclic services on PROFIBUS and PROFINET<sup>1)</sup>

The ET 200S HF motor starters now also provide comprehensive diagnostic data via datasets by means of the acyclic services. The new capability of reading out data from the motor starter for monitoring the devices, plants or the process is available and comprehensive. The motor starter provides three internal logbooks for device faults, trip actions of the motor starter, and events that are provided with a time stamp. These can be read out from the motor starter as needed. They provide the plant operator with comprehensive information about the system status and the process and they can be used to improve them.

<sup>1)</sup> Only for the innovated .-0AB4 starters

The maximum internal current values or the number of motor starter activations, for example, can be read out using the min/max pointer and statistical data functions. This allows process deviations to be monitored or even an initial commissioning can be optimized.

Plant monitoring for the user is facilitated due to available statistical data or measured values.

All of the statuses of the motor starter such as the device status, the device configuration and the communication status are contained in the device diagnostics data record, thus ensuring central device and plant monitoring.

On the one hand, information (I&M) on the module used and, on the other hand, data (I&M) that is defined during the configuration such as the location designations are saved in the motor starter using the Installation and Maintenance functions (I&M). They are used to clear faults or to detect hardware changes in a system or to check the system configuration.

Supported data records:

- DS 0 S7-V1-system diagnostics (S7 diagnostic alarm)
- DS 72, 73, 75 Logbooks, device faults, trip actions, events
- DS 92 Device diagnostics
- DS 93 Command
- DS 94 Measured values
- DS 95 Statistics
- DS 96 Min/max pointer
- DS 100 Device identification
- DS 131 Device parameters
- DS 134 Maintenance
- DS 165 Comment
- DS 226 PROFenergy technology function
- DS 231 I&M 0 (= Device identification)
- DS 232 I&M 1 (= Item designation)
- DS 233 I&M 2 (= Installation)
- DS 234 I&M 3 (= Description)

**Device functions (Firmware Features)**

See ET 200S Motor Starter and Safety Motor Starter, General Data, Overview, page 9/142.

**Technical specifications**

See ET 200S Motor Starter and Safety Motor Starter, General Data, Technical Specifications, page 9/144.

# SIMATIC ET 200 distributed I/O

## ET 200S

Motor starters and safety motor starters  
High Feature motor starter

### Ordering data

#### High Feature motor starter in present version ("-.0AA4 starter")

|                                                                                                                                | Setting range of the electronic release | Order No.             |
|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------|
|                                                                                                                                | A                                       |                       |
| High-Feature motor starters, with diagnostics, solid-state overload protection, fuseless, expandable with brake control module |                                         |                       |
|                                               | <b>DS1e-x direct-on-line starters</b>   |                       |
|                                                                                                                                | 0.3 ... 3                               | 3RK1 301-0AB10-0AA4   |
|                                                                                                                                | 2.4 ... 8                               | 3RK1 301-0BB10-0AA4   |
|                                                                                                                                | 2.4 ... 16                              | 3RK1 301-0CB10-0AA4   |
|                                                                                                                                | <b>RS1e-x reversing starters</b>        |                       |
|                                                                                                                                | 0.3 ... 3                               | 3RK1 301-0AB10-1AA4   |
| DS1e-x                                                                                                                         | 2.4 ... 8                               | 3RK1 301-0BB10-1AA4   |
|                                                                                                                                | 2.4 ... 16                              | 3RK1 301-0CB10-1AA4   |
|                                                                                                                                | <b>DSS1e-x soft starters</b>            |                       |
|                                                                                                                                | 0.3 ... 3                               | F 3RK1 301-0AB20-0AA4 |
|                                                                                                                                | 2.4 ... 8                               | 3RK1 301-0BB20-0AA4   |
|                                                                                                                                | 2.4 ... 16                              | 3RK1 301-0CB20-0AA4   |

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#### High Feature motor starter in completely innovated version ("-.0AB4 starter") available from June 1, 2011<sup>1)</sup>

|                                                                                                                                | Setting range of the electronic release | Order No.           |
|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------|
|                                                                                                                                | A                                       |                     |
| High Feature motor starters, with diagnostics, solid-state overload protection, fuseless, expandable with brake control module |                                         |                     |
|                                             | <b>DS1e-x direct starters</b>           |                     |
|                                                                                                                                | 0.3 ... 3                               | 3RK1 301-0AB10-0AB4 |
|                                                                                                                                | 2.4 ... 8                               | 3RK1 301-0BB10-0AB4 |
|                                                                                                                                | 2.4 ... 16                              | 3RK1 301-0CB10-0AB4 |
|                                                                                                                                | <b>S1e-x reversing starters</b>         |                     |
|                                                                                                                                | 0.3 ... 3                               | 3RK1 301-0AB10-1AB4 |
| DS1e-x                                                                                                                         | 2.4 ... 8                               | 3RK1 301-0BB10-1AB4 |
|                                                                                                                                | 2.4 ... 16                              | 3RK1 301-0CB10-1AB4 |
|                                                                                                                                | <b>DSS1e-x soft starters</b>            |                     |
|                                                                                                                                | 0.3 ... 3                               | 3RK1 301-0AB20-0AB4 |
|                                                                                                                                | 2.4 ... 8                               | 3RK1 301-0BB20-0AB4 |
|                                                                                                                                | 2.4 ... 16                              | 3RK1 301-0CB20-0AB4 |

<sup>1)</sup> Due to the technical compatability of the present and current motor starters, there will be a change with 6 months bridging time. In case of replacement, the innovate motor starter runs in the DPV0 mode as the present motor starter also does.

Overview

TM-DS, TM-RS terminal modules  
(See also Motor starters and safety motor starters ET 200S,  
General data, Overview, section Terminal modules, page 9/140)

- "-S32" version with supply terminals: 2 x 3 x 10 mm² screw terminals for power bus and motor feeder
- "-S31" version without supply terminals: 1 x 3 x 10 mm² screw terminals for motor feeder
- Optionally expandable with PE/N modules (see Accessories)

Technical specifications

See "Technical Specifications" on "Standard terminal modules",  
page 9/146

Ordering data

| Version                                                                           |                                                                                                                                                                           | Order No.               |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Terminal modules for High Feature motor starters                                  |                                                                                                                                                                           |                         |
|  | <b>TM-DS65-S32</b><br><b>for DS1e-x and DSS1e-x direct-on-line starters</b><br>with incoming power bus connection including three caps for terminat-<br>ing the power bus | F <b>3RK1 903-0AK00</b> |
|                                                                                   | <b>TM-DS65-S31</b><br><b>for DS1e-x and DSS1e-x direct-on-line starters</b><br>without incoming power bus connection                                                      | F <b>3RK1 903-0AK10</b> |
|                                                                                   | <b>TM-RS130-S32</b><br><b>for RS1e-x reversing starters</b><br>with incoming power bus connection including three caps for terminat-<br>ing the power bus                 | F <b>3RK1 903-0AL00</b> |
|                                                                                   | <b>TM-RS130-S31</b><br><b>for RS1e-x reversing starters</b><br>without incoming power bus connection                                                                      | F <b>3RK1 903-0AL10</b> |

3RK1 903-0AK00

F: Subject to export regulations AL: N and ECCN: EAR99



# SIMATIC ET 200 distributed I/O

## ET 200S

### Motor starters and safety motor starters

#### Power module

#### Overview

- Disconnection of a complete group of motor starters is possible without any additional outlay (safety category 1 according to ISO 13849-1)
- PM-D power modules are plugged onto the TM-P15 terminal modules. (A PM-D power module must be followed by at least one motor starter or one frequency converter.)

PM-D power modules are used for monitoring the two 24 V DC auxiliary voltages for the group of motor starters following on the right or for supplying power to the group of frequency converters following on the right. The voltage is fed in through TM-D terminal modules to the self-assembling potential bars.

A voltage failure is signaled through PROFIBUS diagnostics to the higher-level master. Additional LEDs inform locally about the status of the auxiliary voltages.

The separation of auxiliary voltages for signal checkback and power section actuation enables the entire group to be shut down while maintaining the diagnostic capability.

#### Technical specifications

| PM-D power module<br>3RK1 903-0BA00                                 |                 |                               |
|---------------------------------------------------------------------|-----------------|-------------------------------|
| <b>Rated control supply voltage <math>U_s</math></b><br>up to 60 °C | V               | 20.4 ... 28                   |
| <b>Rated operational current <math>I_e</math></b>                   |                 |                               |
| • Recommended short-circuit protection                              | A               | 10                            |
| • Melting fuse                                                      | A               | 10                            |
| • Miniature circuit breakers                                        | A               | 10, tripping characteristic B |
| <b>Power consumption from the backplane bus</b>                     | mA              | ≤ 10                          |
| <b>Supplying</b>                                                    |                 |                               |
| • Motor starters                                                    |                 | Yes                           |
| • Frequency converters                                              |                 | Yes                           |
| • Motor starters for safety technology                              |                 | No                            |
| • Solid-state modules                                               |                 | No                            |
| • Ex(i) modules                                                     |                 | No                            |
| <b>Alarms</b>                                                       |                 | None                          |
| <b>Diagnostic functions</b>                                         |                 |                               |
| • System fault/device fault                                         |                 | Yes                           |
| • Monitoring the supply voltage for solid-state modules $U_1$       |                 | Red "SF" LED                  |
| • Monitoring the supply voltage for contactors $U_2$                |                 | Green "PWR" LED               |
| • diagnostic information can be read out                            |                 | Green "CON" LED               |
| <b>Conductor cross-sections</b>                                     |                 |                               |
| • Flexible with end sleeve                                          | mm <sup>2</sup> | 1.5                           |
| • Rigid                                                             | mm <sup>2</sup> | 2.5                           |
| <b>Mounting dimensions (W x H x D)</b>                              | mm              | 15 x 195.5 x 117.5            |

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#### Ordering data

| Version                                                                                                                                      |  | Order No.               |
|----------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------|
| <b>Power module</b>                                                                                                                          |  |                         |
|  <b>PM-D power module</b><br>for 24 V DC with diagnostics |  | F <b>3RK1 903-0BA00</b> |

3RK1 903-0BA00

F: Subject to export regulations AL: N and ECCN: EAR99

**Overview***Terminal module for power module*

For supplying load and sensor voltage to the self-assembling potential bars of the Standard motor starters, High-Feature motor starters and frequency converters. Power modules for voltage monitoring are plugged onto TM-P modules. TM-P modules can be used any number of times within the ET 200S. A power module must always be plugged upstream from the first motor starter/frequency converter.

**Ordering data**

| Version                                                                           |                                      | Order No.             |
|-----------------------------------------------------------------------------------|--------------------------------------|-----------------------|
| <b>Terminal module for power module</b>                                           |                                      |                       |
|  | <b>TM-P15 S27-01 terminal module</b> | <b>3RK1 903-0AA00</b> |
|                                                                                   | for PM-D power module                |                       |
| 3RK1 903-0AA00                                                                    |                                      |                       |

# SIMATIC ET 200 distributed I/O

## ET 200S

### Motor starters and safety motor starters ET 200S fail-safe motor starter

#### Overview



Fail-safe motor starter ET 200S: F-DS1e-x direct-on-line starter

The fail-safe motor starter has been developed on the basis of the High-Feature motor starter (-0AA4 starter). It differs in that, in addition to a motor starter protector and contactor assembly, a safe solid-state evaluation circuit is installed for error detection purposes which makes the motor starter fail-safe.

If the contactor to be switched fails in an EMERGENCY-STOP case, the evaluation electronics detects a fault and opens the motor starter protector in the motor starter through a shunt release in a fail-safe manner. The second redundant shutdown component is therefore no longer a main contactor, as is generally the case, but the motor starter protector installed in the motor.

#### All functions of the High-Feature starter are already integrated

The new fail-safe motor starters are characterized by easy, space-saving assembly as well as minimal wiring outlay.

Like the High-Feature starters, the fail-safe motor starters have a switching capacity of up to 7.5 kW (16 A) which is achieved with just two motor starter versions. Another important feature is the high availability due to the high short-circuit strength (type of coordination "2").

#### Use

The fail-safe motor starter is predestined for use in combination with PROFIsafe (see figure ET 200S Safety Motor Starter Solution PROFIsafe with fail-safe Motor Starters on page 6/162). Another field of application is in combination with ASIsafe or safety relays (see example 2 on page 9/160 fail-safe Motor Starters with ASIsafe and 3TK28).

#### High degree of flexibility with safety technology

##### PROFIsafe solution with PM-D F PROFIsafe

In EMERGENCY-STOP applications, the fail-safe motor starters are selectively switched off through the upstream PM-D F PROFIsafe safety module. For each safety module, six switch-off groups can be formed. In the first delivery stage, the fail-safe freely-programmable logic of the SIMATIC controller is used to interface with the relevant fail-safe sensor technology. The interface between PROFIsafe and installations that use conventional safety technologies is implemented through the F-CM fail-safe contact multiplier with four floating contacts.

##### Solution local with PM-D FX1

Fail-safe motor starter with safety relay (Version 1) or ASIsafe (Version 2, see example 2, page 9/160):

Signals with relevance for safety can be input to ET 200S through a PM-D F X1 infeed terminal module through the enabling circuits of the AS-i Safety Monitor or the safety relay to control the fail-safe motor starters which then selectively switch off the downstream motors.

#### Technical specifications

##### F-DS1e-x direct-on-line starters/F-RS1e-x reversing starter

|                                                 |                          | F-DS1e-x direct-on-line starters              | F-RS1e-x reversing starters                |
|-------------------------------------------------|--------------------------|-----------------------------------------------|--------------------------------------------|
| <b>Dimensions</b>                               |                          |                                               |                                            |
| <b>Dimensions (W x H x D)</b>                   | mm                       | 65 x 290 x 150<br>(incl. terminal module)     | 130 x 290 x 150<br>(incl. terminal module) |
| <b>Height with PE/N module</b>                  | mm                       | 332                                           |                                            |
| <b>Depth with 2DI control module (not safe)</b> | mm                       | 173                                           |                                            |
| <b>Module-specific data</b>                     |                          |                                               |                                            |
| <b>Type of coordination</b>                     |                          | Type 2 up to $I_{\theta} \leq 16$ A at 400 V  |                                            |
| <b>Internal power supply</b>                    |                          | U1 (from PM-D F/PM-DF X1)                     |                                            |
| <b>Maximum achievable safety class</b>          |                          | SIL 3<br>Shutdown class 6 (AK6)<br>Category 4 |                                            |
| <b>Safety characteristics</b>                   |                          |                                               |                                            |
| Low demand                                      |                          |                                               |                                            |
| • Test interval 3 months                        | PFD <sub>AVG</sub> (10a) | $3.5 \times 10^{-5}$                          |                                            |
| • Test interval 6 months                        |                          | $8.0 \times 10^{-5}$                          |                                            |
| High demand/continuous mode                     |                          |                                               |                                            |
| • Test interval 3 months                        | PFH                      | $8.1 \times 10^{-10}$                         |                                            |
| • Test interval 6 months                        | 1/h                      | $1.8 \times 10^{-9}$                          |                                            |
| Proof-test interval                             | Years                    | 10                                            |                                            |

**Technical specifications** (continued)**F-DS1e-x direct-on-line starters/F-RS1e-x reversing starter**

|                                                                           |    | F-DS1e-x direct-on-line starters                  | F-RS1e-x reversing starters |
|---------------------------------------------------------------------------|----|---------------------------------------------------|-----------------------------|
| <b>Voltages, currents, potentials</b>                                     |    |                                                   |                             |
| <b>Switching capacity</b>                                                 |    | Up to 7.5 kW at 400 V AC in three setting ranges: |                             |
|                                                                           | A  | 0.3 ... 3                                         |                             |
|                                                                           | A  | 2.4 ... 8                                         |                             |
|                                                                           | A  | 2.4 ... 16                                        |                             |
| <b>Status, alarms, diagnostics</b>                                        |    |                                                   |                             |
| <b>Status display</b>                                                     |    | SF, DEVICE and C-STAT, SG1 ... SG6                |                             |
| <b>Diagnostic functions</b>                                               |    |                                                   |                             |
| Group fault display                                                       |    | Red LED (SF)                                      |                             |
| Diagnostic information can be read out                                    |    | Available                                         |                             |
| <b>Control circuit</b>                                                    |    |                                                   |                             |
| <b>Rated operational voltage for electronics <math>U_1</math></b>         | V  | 24 DC (20.4 ... 28.8 DC)                          | 24 DC (21.6 ... 26.4 DC)    |
| <b>Reverse polarity protection for electronics <math>U_1</math></b>       |    | Yes                                               |                             |
| <b>Rated operational voltage for contactor <math>U_2</math></b>           | V  | 24 DC (20.4 ... 28.8 DC)                          |                             |
| <b>Reverse polarity protection for contactor <math>U_2</math></b>         |    | Yes                                               |                             |
| <b>Power consumption</b>                                                  |    |                                                   |                             |
| • From electronics supply $U_1$                                           | mA | Approx. 40                                        | Approx. 100                 |
| • From contactor supply $U_2$                                             |    |                                                   |                             |
| - Pickup                                                                  | A  | 1.7 (for 80 ms)                                   | --                          |
| - Hold                                                                    | mA | max. 350                                          | --                          |
| • From SG1 up to 6                                                        |    |                                                   |                             |
| - Pickup                                                                  | mA | 250 (for 200 ms)                                  |                             |
| - Hold                                                                    | mA | max. 55                                           |                             |
| • Test function of the shunt release/starter protector (50 ms) from $U_1$ | A  | Approx. 1.5                                       |                             |
| • From the backplane bus                                                  | mA | Approx. 20                                        |                             |
| <b>Main circuit</b>                                                       |    |                                                   |                             |
| <b>Rated operational voltage <math>U_0</math></b>                         |    |                                                   |                             |
| • Acc. to VDE 0106, part 1014, IEC 60947-1, EN 60947-1                    | V  | 500 AC                                            |                             |
| • Protective separation between main and auxiliary circuits               | V  | 400                                               |                             |
| • UL, CSA                                                                 | V  | 600 AC                                            |                             |
| <b>Rated insulation voltage <math>U_i</math></b>                          | V  | 500 AC                                            |                             |
| <b>Rated impulse withstand voltage <math>U_{imp}</math></b>               | kV | 6                                                 |                             |
| <b>Rated frequency</b>                                                    | Hz | 50/60                                             |                             |

## SIMATIC ET 200 distributed I/O

## ET 200S

Motor starters and safety motor starters  
ET 200S fail-safe motor starter

## Ordering data

| Version                                                                                                                  |                                                                                                                                                              | Order No.                                                                              |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Fail-safe motorstarter ET 200S                                                                                           |                                                                                                                                                              |                                                                                        |
| <br><br>F-DS1e-x direct-on-line starter | <b>F-DS1e-x direct-on-line starters</b><br>Fail-safe direct-on-line starters up to 7.5 kW at 400 V AC<br>Mechanically switching<br>Solid-state UE protection |                                                                                        |
|                                                                                                                          | <ul style="list-style-type: none"><li>• 0.3 ... 3 A</li><li>• 2.4 ... 8 A</li><li>• 2.4 ... 16 A</li></ul>                                                   | <b>3RK1 301-0AB13-0AA4</b><br><b>3RK1 301-0BB13-0AA4</b><br><b>3RK1 301-0CB13-0AA4</b> |
|                                                                                                                          | <b>F-RS1e-x reversing starters</b><br>Fail-safe reversing starters up to 7.5 kW at 400 V AC<br>Mechanically switching<br>Solid-state UE protection, fuseless |                                                                                        |
|                                                                                                                          | <ul style="list-style-type: none"><li>• 0.3 ... 3 A</li><li>• 2.4 ... 8 A</li><li>• 2.4 ... 16 A</li></ul>                                                   | <b>3RK1 301-0AB13-1AA4</b><br><b>3RK1 301-0BB13-1AA4</b><br><b>3RK1 301-0CB13-1AA4</b> |
|                                                                                                                          | Terminal modules for fail-safe motor starters                                                                                                                |                                                                                        |
|                                                                                                                          | <b>TM-FDS65-S32-01/S31-01 terminal module</b><br>for F-DS1e-x direct-on-line starters<br>with coding                                                         |                                                                                        |
|                                                                                                                          | <ul style="list-style-type: none"><li>• With incoming power bus connection<br/>(TM-FDS65-S32-01)</li></ul>                                                   | F <b>3RK1 903-3AC00</b>                                                                |
|                                                                                                                          | <ul style="list-style-type: none"><li>• Without incoming power bus connection<br/>(TM-FDS65-S31-01)</li></ul>                                                | F <b>3RK1 903-3AC10</b>                                                                |
|                                                                                                                          | <b>TM-FRS130-S32-01/S31-01 terminal module</b><br>for F-RS1e-x reversing starter<br>with coding                                                              |                                                                                        |
|                                                                                                                          | <ul style="list-style-type: none"><li>• With incoming power bus connection<br/>(TM-FRS130-S32-01)</li></ul>                                                  | F <b>3RK1 903-3AD00</b>                                                                |
|                                                                                                                          | <ul style="list-style-type: none"><li>• Without incoming power bus connection<br/>(TM-FRS130-S31-01)</li></ul>                                               | F <b>3RK1 903-3AD10</b>                                                                |

F: Subject to export regulations AL: N and ECCN: EAR99

## Overview

### ET 200S Safety motor starters Solutions local/PROFIsafe

The ET 200S Safety motor starter Solutions are used as preferred in all production and process automation fields in which the enhancement of plant availability and flexibility plays a key role.

- **Safety motor starters Solutions local** are used as preferred from the safety technology point of view for locally restricted safety applications. These motor starters are not dependent on a safe control system.
- **Safety motor starters Solutions PROFIsafe** are often found by contrast in safety applications of the more complex type that are interlinked. In this case a safe control system is used with the bus systems PROFINET or PROFIBUS with the PROFIsafe profile.

The ET 200S Safety motor starters Solutions comprise:

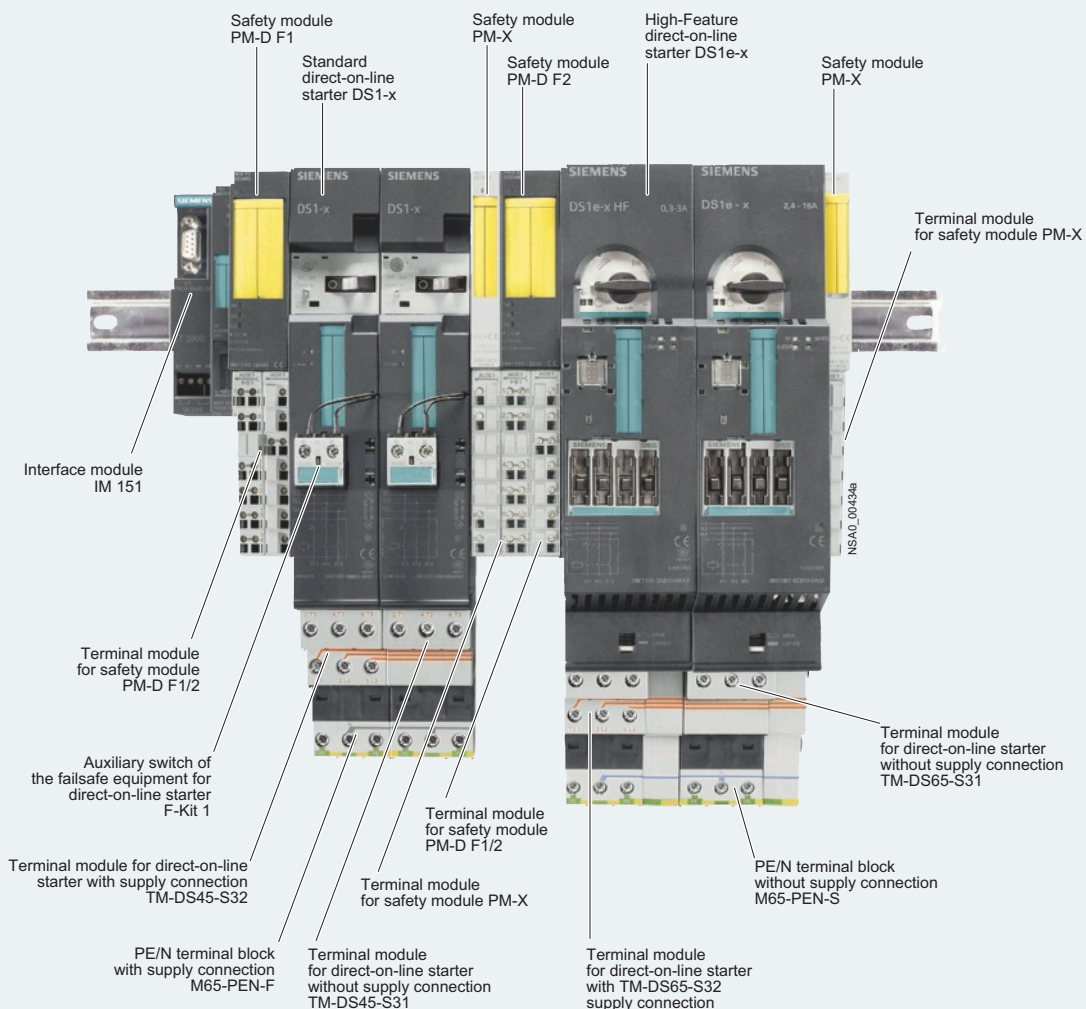
- Safety modules ([page 9/158](#))
- Standard motor starters ([page 9/145](#))
- High-Feature motor starters ([page 9/148](#))
- Fail-safe motor starters ([page 9/154](#))

### Safety motor starter ET 200S Solution local

With the ET 200S Solutions safety motor starters there is no complicated and hence cost-intensive configuring and wiring compared to the conventional safety systems. The ET 200S Solutions safety motor starters are designed for Category 4 according to ISO 13849-1 or SIL 3 IEC 62061.

They enable the use of safety-oriented direct-on-line starters or reversing starters in the SIMATIC ET 200S distributed peripherals system on PROFINET or PROFIBUS. The fine modular architecture of the system permits optimum imaging of machine or plant applications.

Within an ET 200S station, the Solutions safety motor starters can also be combined with Standard motor starters or High Feature motor starters without safety functions or the SIMATIC ET 200S FC frequency converters up to max. 4 kW up to Category 3 according to ISO 13849-1 or SIL 2 according to IEC 62061.



Interplay of ET 200S safety motor starters Solutions local components

# SIMATIC ET 200 distributed I/O

## ET 200S

### Motor starters and safety motor starters Safety module local and PROFIsafe

#### Overview (continued)

##### Components for Safety motor starter ET 200S Solution local

The Safety motor starters ET 200S Solutions local comprise:

Version 1 (see Example 1, page 9/160):

- Safety modules PMD-F1 ... 5
- PM-X module
- Standard motor starter or High Feature motor starter

Version 2 (see Example 2, page 9/160):

- Safety module PM-D FX1
- Fail-safe motor starter

##### Functionality of the Safety motor starters ET 200S Solutions local

- For use of Standard, High-Feature or fail-safe motor starters in systems with safety categories 2 to 4 (according to ISO 13849-1)
- Can also be used in combination with external safety relays
- Can also be used to activate external safety systems
- No complex wiring for conventional safety technology
- Safety module available for function-monitored and automatic starting
- Safety module available for Stop category 0 and 1
- Safety module for monitoring the auxiliary voltages for motor starters
- Safety modules can be plugged into the TM-PF30 terminal modules

With the Safety motor starters Solution local, the highest safety category according to ISO 13849-1 and IEC 62061 can be achieved. This means that it is possible to use it for analyzing EMERGENCY STOP circuits or for protective door monitoring and also for delayed shutdown. Using the contact multiplier, the safety-relevant signals can also be made available to external systems.

All standard safety applications can be covered by combining different TM-PF30 terminal modules. Of course, the ET 200S motor starters can also be used in combination with external safety relays or ASIsafe.

With the Safety Motor Starter Solutions local, up to 80 % of wiring is saved compared to conventional safety systems with local safety applications.

Several safety circuits can be set up using the Safety motor starters Solution local. The safety sensors are directly connected to the safety modules locally. These safety modules take over the task of the otherwise obligatory safety relay and shut down the downstream motor starters depending on the respective selected function. The cross connections required for this are already integrated in the system and do not require additional wiring. All messages of the safety modules are automatically forwarded as diagnostic messages, e.g. when there is a cross circuit in the EMERGENCY STOP circuit.

The safety module evaluates the signal state of the connected safety sensors and, using the integrated safety relays, shuts down the group(s) of downstream motor starters. The shutdown function is monitored by the module, and the auxiliary voltages likewise.

Safety-relevant system alarms, e.g. caused by actuating the EMERGENCY STOP switch or a missing auxiliary voltage, are automatically generated and reported to the interface module. It assigns a unique ID to the error. Such errors can be identified and localized via the PROFIBUS DP diagnostic module without a great deal of programming overhead.

#### **PM-D F1/F2/F3/F4/F5 safety modules**

- PM-D F1/F2/F3/F4 safety modules monitor auxiliary voltages and contain the complete functionality of a safety relay:
  - PM-D F1: For evaluation of EMERGENCY-STOP circuits with the function "monitored start".
  - PM-D F2: For monitoring of protective doors with the function "automatic start".
  - PM-D F3: Expansion to PM-D F1/F2 for time-delayed disconnection.
  - PM-D F4: For expansion of safety circuits with other ET 200S motor starters, e.g. in a different line.
  - PM-D F5: Transmits the status from PM-D F1 ... 4 through four floating enabling circuits to external safety equipment (contact multipliers)
- The PM-D F1 and PM-D F2 modules can be combined with the PM-D F3 or PM-D F4 modules.
- A PM-D F5 can be positioned at any point between a PM-D F1 ... 4 and a PM-X<sup>1)</sup>.
- Safety modules monitor the U1 and U2 auxiliary voltages. A voltage failure is relayed as a diagnostic signal over the bus.
  - No additional PM-D safety module is required when the safety modules are used.
  - Each safety circuit, beginning with a PM-D F1 ... 4, must be terminated with one PM-X<sup>1)</sup> each.

<sup>1)</sup> see Accessories for Safety Module local, page 9/173



Safety Module PM-D F1

#### **PM-D FX1 Safety module**

The PM-D FX1 safety module is used to supply 1 to 6 switch-off groups. The supply voltage can be activated via 1 to 6 external safety shutdown devices (either ASIsafe Monitor or 3TK28 safety relays). This safety module is used for applications with external safety shutdown devices as needed for fully selective safety shutdown of fail-safe motor starters/frequency converters (see example 2, page 9/160).

#### **Terminal modules for safety module (TM-PF30)**

For supplying load and sensor voltage to the potential bars of the motor starters, and for connection of the 2-channel sensor circuit (e.g. EMERGENCY-STOP pushbutton) and a reset button. Different terminal modules are available for the configuration of separate safety circuits or for the cascading of safety circuits, and for applications with time-delayed disconnection. (see page 9/167).

#### Overview (continued)

##### Terminal module (TM-X)

For connection of an external infeed contactor (2nd shutdown possibility). With terminals for contactor coil and feedback contact. Is always required to terminate a group of safety-oriented motor starters.

##### Fail-safe Kit

The fail-safe Kit (F-Kit) must be added to each Standard motor starter in a safety segment in order to monitor the switching function.

F-Kit 1 supplements the DS1-x direct-on-line starter, F-Kit 2 the RS1-x reversing starter.

The F-Kits are comprised of:

- Contact supports for the terminal modules
- One or two auxiliary switch blocks for the contactor/contactors of the motor starter
- Connecting cables

High-Feature motor starters and their terminal modules come as standard with the functionality of the F-Kits integrated.

#### Components needed for applications with safety requirements

| Components needed | Maximum achievable safety integrity according to ISO 13849-1 or IEC 62061 |                    |                  |                                 |                                      |
|-------------------|---------------------------------------------------------------------------|--------------------|------------------|---------------------------------|--------------------------------------|
|                   | ISO 13849-1                                                               | PL b/c, category 1 | PL c, category 2 | PL d <sup>1)</sup> , category 3 | PL d/PL e <sup>1)</sup> , category 4 |
|                   | IEC 62061                                                                 | SIL 1              | SIL 1            | SIL 2                           | SIL 3                                |
| PM-D              |                                                                           | ✓                  | --               | --                              | --                                   |
| PM-D F1/-F2/-F4   |                                                                           | --                 | ✓                | ✓                               | ✓                                    |
| PM-D F3           |                                                                           | --                 | ✓                | ✓                               | --                                   |
| F-Kit 1 / F-Kit 2 |                                                                           | --                 | ✓ <sup>2)</sup>  | ✓ <sup>2)</sup>                 | ✓ <sup>2)</sup>                      |
| PM-X              |                                                                           | --                 | ✓                | ✓                               | ✓                                    |
| PM-D FX1          |                                                                           | --                 | ✓                | ✓                               | ✓                                    |

<sup>1)</sup> An external incoming supply contactor is needed in the main circuit (2-channel).

<sup>2)</sup> F-Kit is only need for the Motor starter Standard; for Motor starter High Feature it is already integrated.

#### Possible combinations of safety and terminal modules

| Terminal module | PM-D F1 | PM-D F2 | PM-D F3 | PM-D F4 | PM-D F5 | PM-X | PM-DFX1 | FCM |
|-----------------|---------|---------|---------|---------|---------|------|---------|-----|
| TM-PF30 S47-B0  | ✓       | ✓       | --      | --      | --      | --   | --      | --  |
| TM-PF30 S47-B1  | ✓       | ✓       | --      | --      | --      | --   | --      | --  |
| TM-PF30 S47-C0  | --      | --      | ✓       | ✓       | --      | --   | --      | --  |
| TM-PF30 S47-C1  | --      | --      | ✓       | ✓       | --      | --   | --      | --  |
| TM-PF30 S47-D0  | --      | --      | --      | --      | ✓       | --   | --      | --  |
| TM-X15 S27-01   | --      | --      | --      | --      | --      | ✓    | --      | --  |
| TM-PFX30 S47-G0 | --      | --      | --      | --      | --      | --   | ✓       | --  |
| TM-PFX30 S47-G1 | --      | --      | --      | --      | --      | --   | ✓       | --  |
| TM-FCM30 S47    | --      | --      | --      | --      | --      | --   | --      | ✓   |



# SIMATIC ET 200 distributed I/O

## ET 200S

### Motor starters and safety motor starters Safety module local and PROFIsafe

#### Overview (continued)

##### Examples

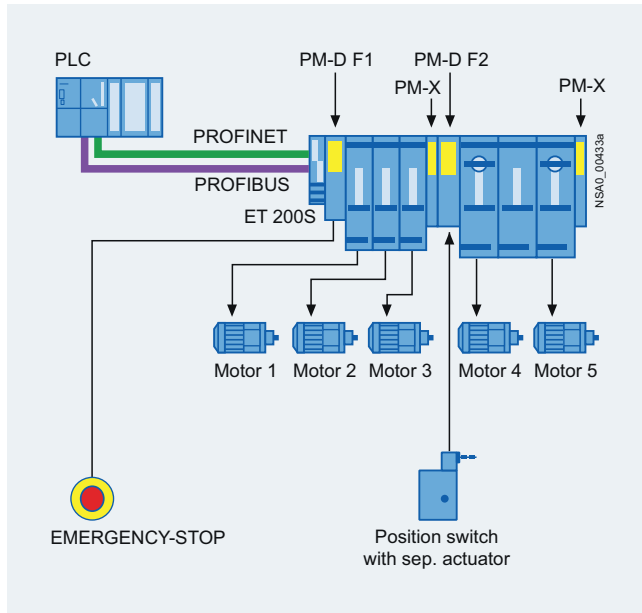
The diverse possible uses of the safety motor starter Solutions local are presented in the manual SIMATIC ET 200S Motor Starters in the context of typical sample applications.

Safety functional examples for easy, quick and low-cost implementations of applications with Safety motor starters Solutions local are available on the Internet:

You can find more information on the Internet:

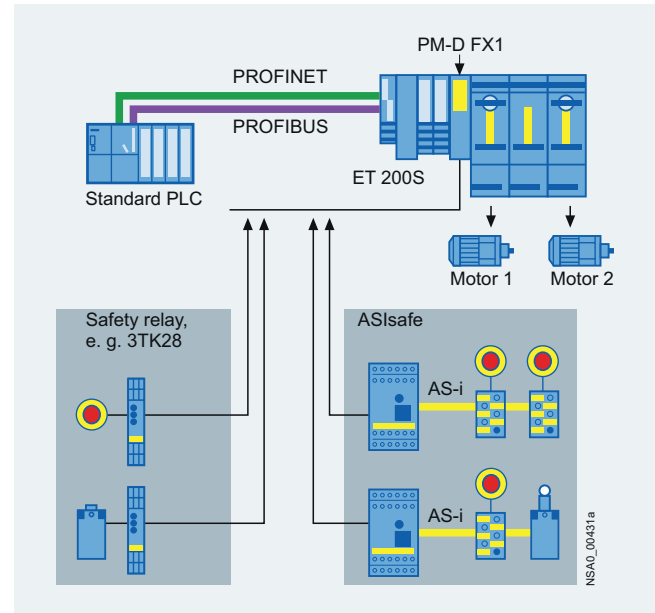
[www.siemens.com/ET200S-Motorstarter](http://www.siemens.com/ET200S-Motorstarter)

#### Example 1:



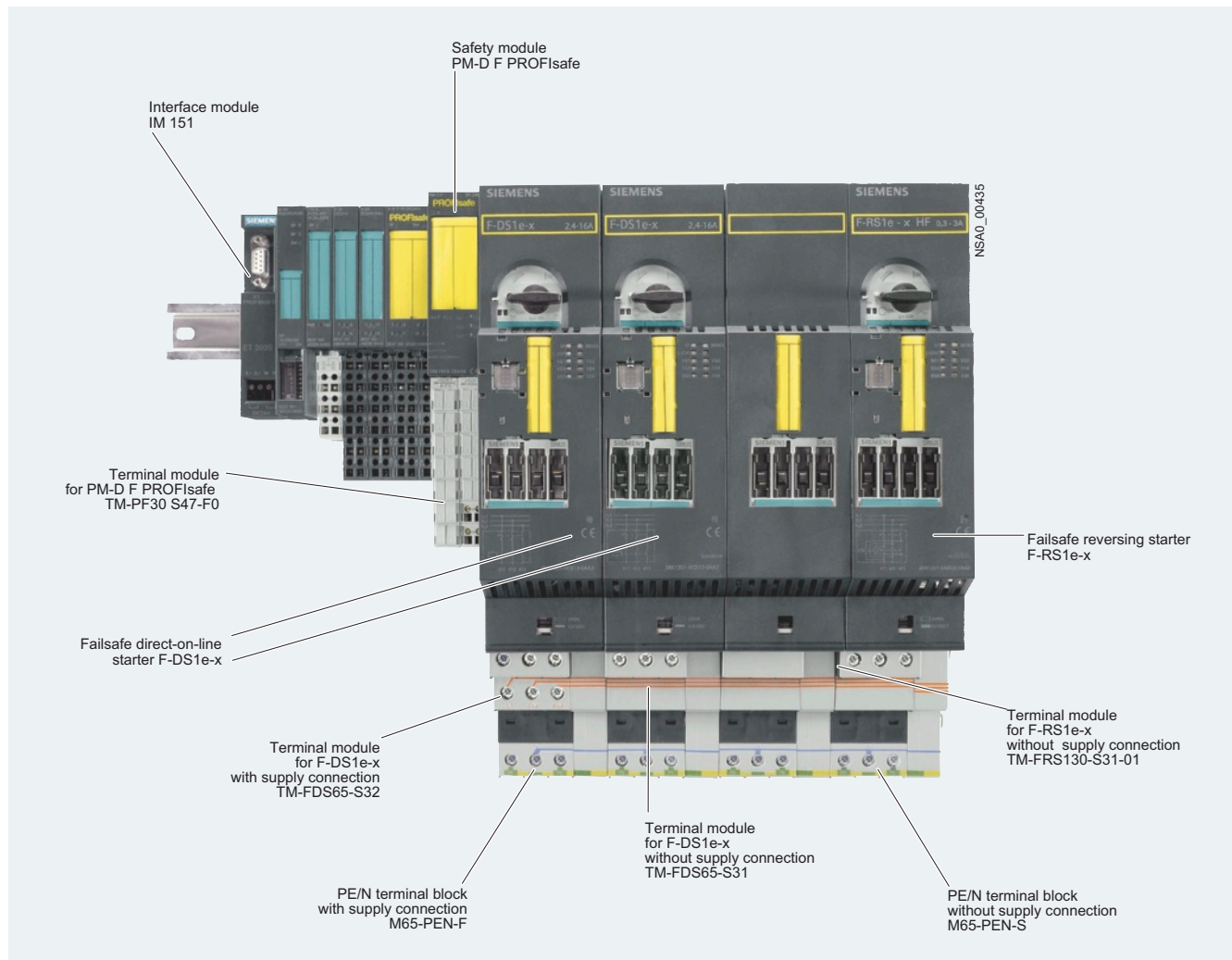
ET 200S safety motor starter Solutions local with 2 safety circuits (= switch-off groups), Standard motor starters and High-Feature motor starters.

#### Example 2:



ET 200S safety motor starter Solutions local with 2 external safety assemblies (= safety relays or ASIsafe monitors) and with fail-safe motor starters (PM-DFX1 application). 2 of the 6 available safe switch-off groups are used.

Signals with relevance for safety can be input to ET 200S through a PM-DFX1 infeed terminal module through the enabling circuits of the ASIsafe monitor or the safety relay to control the fail-safe motor starters which then selectively switch off the downstream motors.

**Overview** (continued)**Safety Motor starter ET 200S Solutions PROFIsafe**

Interplay of ET 200S Safety motor starter Solutions PROFIsafe components

Components for Safety motor starter ET 200S Solution PROFIsafe

The Safety motor starters ET 200S Solutions PROFIsafe consist of (see example, page 9/162):

- PMD-F PROFIsafe safety modules
- Fail-safe motor starter
- Safe control with the PROFINET or PROFIBUS bus systems with the PROFIsafe profile

Functionality of the Safety motor starter ET 200S Solutions PROFIsafe

- For the use of fail-safe motor starters in plants with safety category 2 to 4 according to ISO 13849-1 and SIL 2 and 3 acc. to IEC 62061. The use of Standard or High-Feature motor starters is also possible with certain assemblies
- High flexibility (any assignment of sensors to motor starters using the PLC)
- Full selectivity of disconnection of the fail-safe motor starters
- No complex wiring for conventional safety systems, e.g. no in-feed contactors even in the highest safety category

- Can also be used to activate external safety systems through F-CM contact multiplier
- Safety module available for any safety function
- Safety module available for Stop category 0 and 1
- Safety module for monitoring the auxiliary voltages for motor starters
- Safety modules can be plugged into the TM-PF30 terminal modules

Sensor and actuator assignment are freely configurable within the framework of the distributed safety concept:

The logic of the safety functions is implemented by software. Safety-oriented PROFIsafe communication and the use of a safety-oriented control system are required. Integration of the safety technology in the standard automation is realized through a single bus system (see Advantages of PROFIsafe), using PROFIBUS as well as PROFINET.

# SIMATIC ET 200 distributed I/O

## ET 200S

Motor starters and safety motor starters  
Safety module local and PROFIsafe

### Overview (continued)

#### High degree of flexibility with safety technology Fail-safe motor starters for PROFIsafe

In EMERGENCY-STOP applications, the fail-safe motor starters are selectively switched off through the upstream PM-D F PROFIsafe safety module. For each safety module, six switch-off groups can be formed. In the first delivery stage, the fail-safe freely-programmable logic of the SIMATIC controller is used to interface with the relevant fail-safe sensor technology.

#### Contact multiplier F-CM

The interface between PROFIsafe and installations that use conventional safety technologies is implemented through the F-CM fail-safe contact multiplier with four floating contacts

#### PM-D F PROFIsafe safety modules

The PM-D F PROFIsafe safety module receives the shutdown signal from the interface module of the ET 200S and safely switches off 1 to 6 switch-off groups. This safety module is used in PROFIsafe applications where there is a need for the selective shutdown of fail-safe motor starters/frequency converters.

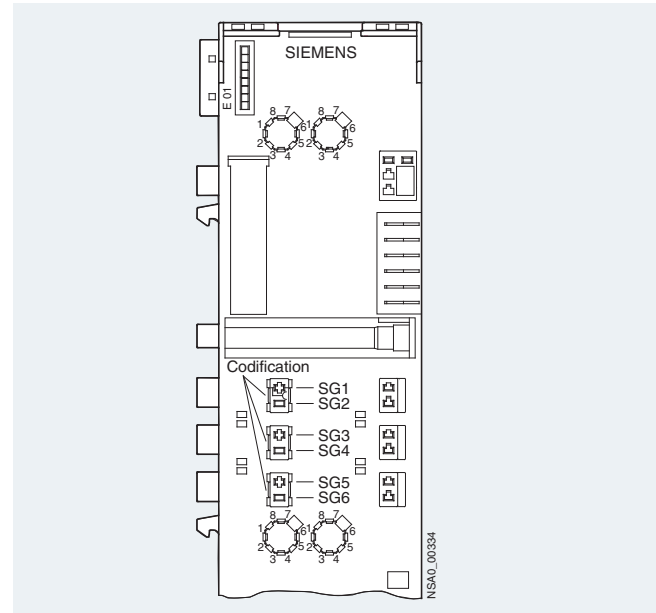


PM-D F PROFIsafe with TM-PF30 S47-F0 terminal modules

#### Terminal modules

The terminal assignment of the terminal modules for safe motor starters corresponds to the terminal assignment of the 45 and 65 mm terminal modules. The terminal modules for safe motor starters have a coding module in addition. This enables the safe motor starter to be assigned to one of the six switch-off groups.

The terminal module contains three coding elements which fully cover the three coding openings in the terminal module. The labeled coding element contains (in the chamber marked with the dash) the busbar tap; the non-labeled coding elements are used only to cover the coding openings. Switch-off group 1 (AG1 or SG1) is coded in the delivery state. The coding can be changed to switch-off group 2 by releasing the coding element and turning it through 180°. Changing the coding to switch-off group 3 is possible by exchanging the labeled and blank coding elements. In this case the dash on the labeled coding element must correlate with the dash of the required switch-off group (symbolized busbar).



The fail-safe motor starters are assigned to one of the six switch-off groups.

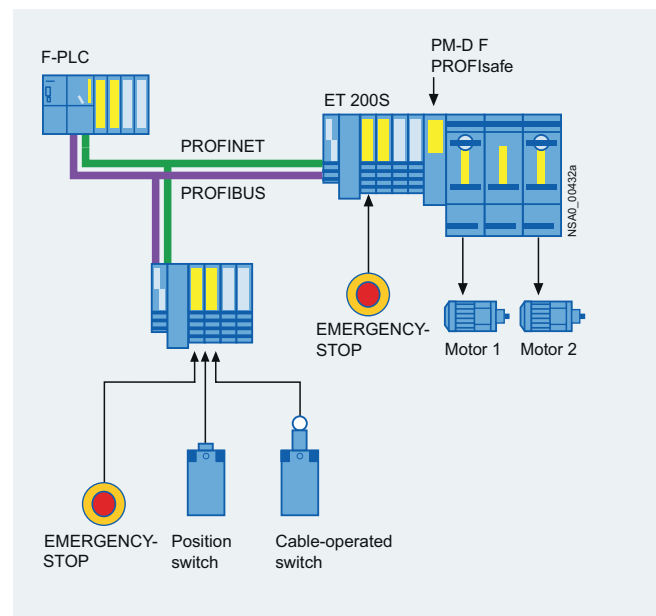
#### Example:

The diverse possible uses of the Safety motor starter Solutions PROFIsafe are presented in the manual SIMATIC ET 200S Motor Starters in the context of typical sample applications.

Safety functional examples for easy, quick and low-cost implementations of applications with safety motor starters Solution PROFIsafe are available on the Internet:

You can find more information on the Internet at:

[www.siemens.com/ET200S](http://www.siemens.com/ET200S)



ET 200S Safety Motor starter Solution PROFIsafe with motor starters fail-safe and fully selective disconnection (PM-DF PROFIsafe application)

**Overview** (continued)

Within an ET 200S station the fail-safe motor starters are assigned to one of 6 safety segments. For plants with distributed configuration, the shutdown signals of these safety segments are preferably issued by a higher-level, safety-oriented control system via PROFIsafe. This permits the greatest flexibility for assigning the motor starters to different safety circuits.

Alternatively, an ET 200S F CPU can also be used for control purposes.

If a safety-oriented SIMATIC CPU is used, the ET 200S is available as a safety-oriented peripheral. Nevertheless, in such a station it is possible to configure conventional motor starters and input/output modules mixed with modules with safety functions.

Thanks to the PROFIsafe profile, the safety functions are available in the complete network, which means that the Safety motor

starter Solutions PROFIsafe enable the selective disconnection of fail-safe motor starters or the disconnection of a group of Standard and High-Feature motor starters regardless of where and on which peripheral station the safe control devices were connected. As such, this solution provides an unprecedented level of flexibility and reduction of wiring for applications in wide-spread plants or with a sporadic demand for changes in the assignment of safety segments.

The Solution PROFIsafe safety motor starters are ideally suited for safety concepts with Cat. 2 to 4 according to ISO 13849-1 or up to SIL 3 according to IEC 62061.

Each safety module switches up to 6 switch-off groups for fail-safe motor starters/frequency converters.

**Technical specifications**

| PM-D F1, F2, F3, F4 and F5 safety modules                                       |                  |                                                                                          |
|---------------------------------------------------------------------------------|------------------|------------------------------------------------------------------------------------------|
| <b>Mechanical endurance</b>                                                     | Operating cycles | 10 x 10 <sup>6</sup>                                                                     |
| <b>Electrical endurance</b>                                                     |                  | 200 000 at $I_e$                                                                         |
| <b>Utilization categories</b>                                                   |                  | DC-13                                                                                    |
| <b>Control times</b>                                                            |                  |                                                                                          |
| • Minimum command duration                                                      | ms               | 200                                                                                      |
| • Recovery time                                                                 | s                | < 1                                                                                      |
| • Off-delay                                                                     | ms               | 30                                                                                       |
| <b>Control circuit <math>U_1</math></b>                                         |                  |                                                                                          |
| • Rated control supply voltage $U_s$                                            | V                | 24 DC                                                                                    |
| • Operating range DC up to 60 °C                                                |                  | 0.85 ... 1.2 x $U_s$                                                                     |
| • Power consumption                                                             | W                | 2.4                                                                                      |
| • Recommended short-circuit protection                                          |                  | gG 2 A                                                                                   |
| • Output OUT+/OUT- for control of expansion modules                             |                  | 24 V DC/< 50 mA (PTC fuse)                                                               |
| <b>Switched auxiliary circuit <math>U_2</math></b>                              |                  |                                                                                          |
| • Rated control supply voltage $U_s$                                            | V                | 24 DC                                                                                    |
| • Operating range DC up to 60 °C                                                |                  | 0.85 ... 1.2 x $U_s$                                                                     |
| • Rated operational current $I_e$ (13 ... 24 V DC)                              | A                | 4                                                                                        |
| • Uninterrupted thermal current $I_{th}$                                        | A                | 5                                                                                        |
| <b>Recommended short-circuit protection for enabling and signaling circuits</b> |                  | Fuse links:<br>NH type 3NA, DIAZED type 5SB, NEOZED type 5SE<br>Operational class gG 6 A |
| <b>Supplying</b>                                                                |                  |                                                                                          |
| • Motor starters                                                                |                  | Yes                                                                                      |
| • Solid-state modules                                                           |                  | No                                                                                       |
| • Ex(i) modules                                                                 |                  | No                                                                                       |
| • BG certification                                                              |                  | Yes                                                                                      |
| • UL-, CSA certification                                                        |                  | Yes                                                                                      |
| <b>Cable length for EMERGENCY-STOP and ON pushbuttons</b>                       | m                | Max. 1 000                                                                               |
| <b>Mounting dimensions (W x H x D)</b>                                          | mm               | 30 x 196.5 x 117.5 (incl. terminal module)                                               |
| <b>Enabling circuits with PM-D F5</b>                                           |                  | 4 (floating)                                                                             |

# SIMATIC ET 200 distributed I/O

## ET 200S

Motor starters and safety motor starters  
Safety module local and PROFIsafe

### Technical specifications (continued)

| PM-D FX1 safety module (infeed terminal module)                     |    |                                                                          |
|---------------------------------------------------------------------|----|--------------------------------------------------------------------------|
| <b>Dimensions</b>                                                   |    |                                                                          |
| Mounting dimensions (W x H x D)                                     | mm | 30 x 196.5 x 117.5 (incl. terminal module)                               |
| <b>Module-specific data</b>                                         |    |                                                                          |
| Ambient temperature                                                 | °C | 0 ... +60                                                                |
| Degree of protection                                                |    | IP20                                                                     |
| Maximum achievable safety classes                                   |    | SIL 3                                                                    |
| • IEC 62508                                                         |    | Shutdown class 5 and 6                                                   |
| • DIN V 19250                                                       |    | Category 4                                                               |
| • EN 954-1                                                          |    |                                                                          |
| <b>Safety characteristics</b>                                       |    |                                                                          |
| Proof-test interval                                                 |    | 10 years                                                                 |
| <b>Voltages, currents, potentials</b>                               |    |                                                                          |
| Rated control supply voltage $U_s$                                  | V  | 21.6 ... 26.4 DC up to 60 °C                                             |
| Rated operational current $I_e$                                     | A  | 6                                                                        |
| Recommended upstream short-circuit protection                       | A  | Internal protection with 7 A melting fuse (quick)<br>Melting fuse gG 6.3 |
| Supplying                                                           |    | Yes                                                                      |
| • Fail-safe motor starters                                          |    | Yes                                                                      |
| • Fail-safe frequency converters                                    |    | No                                                                       |
| • Solid-state modules                                               |    | No                                                                       |
| • Ex[i] modules                                                     |    | No                                                                       |
| Power consumption                                                   |    |                                                                          |
| • From the backplane bus                                            | mA | ≤ 10                                                                     |
| • From $U_1$                                                        | mA | ≤ 35                                                                     |
| • From SGx                                                          | mA | ≤ 15                                                                     |
| <b>Status, alarms, diagnostics</b>                                  |    |                                                                          |
| Alarms                                                              |    | None                                                                     |
| Diagnostic functions                                                |    | Red "SF" LED                                                             |
| • Group fault/device fault                                          |    | Green PWR LED                                                            |
| • Monitoring the supply voltage for solid-state modules $U_1$ (PWR) |    | Green LED SG1 ... SG6                                                    |
| • Monitoring of six switch-off groups                               |    | Yes                                                                      |
| • diagnostic information can be read out                            |    |                                                                          |
| Standards, approvals                                                |    | Yes                                                                      |
| • TÜV                                                               |    | Yes                                                                      |
| • UL-, CSA certification                                            |    |                                                                          |

| F-CM contact multipliers                                            |    |                                                                         |
|---------------------------------------------------------------------|----|-------------------------------------------------------------------------|
| <b>Dimensions</b>                                                   |    |                                                                         |
| Dimensions (W x H x D)                                              | mm | 30 x 196.5 x 117.5 (incl. terminal module)                              |
| <b>Module-specific data</b>                                         |    |                                                                         |
| Number of relay outputs                                             |    | 4 (4 x 1-channel or 2 x 2-channel safe coupling/contact multiplication) |
| Internal power supply for bar                                       |    | $U_1$ (from PM-D F/PM-D FX1)                                            |
| Maximum achievable safety class                                     |    | SIL3                                                                    |
| • Acc. to IEC 61508                                                 |    | AK 6                                                                    |
| • Acc. to VDE 0801                                                  |    | Cat. 4                                                                  |
| • Acc. to EN 954                                                    |    |                                                                         |
| <b>Voltages, currents, potentials</b>                               |    |                                                                         |
| Switching capacity of the relay outputs                             |    | Utilization category DC-13 ( $I_e/U_e$ ):<br>1.5 A / 24 V               |
| Electrical separation                                               |    | Yes                                                                     |
| • Between outputs and backplane bus                                 |    | Yes                                                                     |
| • Between outputs and power supply                                  |    | Yes                                                                     |
| • Between outputs                                                   |    | Yes                                                                     |
| • Between outputs/power supply and shield                           |    | Yes                                                                     |
| <b>Status, alarms, diagnostics</b>                                  |    |                                                                         |
| Status display                                                      |    | PWR and STAT                                                            |
| Alarms: diagnostic alarm                                            |    | None                                                                    |
| diagnostic functions                                                |    | Yes                                                                     |
| • Group fault display                                               |    | Red LED (SF)                                                            |
| • Diagnostic information can be read out                            |    | Available                                                               |
| • Monitoring the supply voltage for solid-state modules $U_1$ (PWR) |    | Green PWR LED                                                           |
| • Monitoring the switching state of the enabling circuit            |    | Red/green STAT LED                                                      |

## Technical specifications (continued)

| PM-D F PROFIsafe safety modules           |      |                                                                                                                                                                                                                                                                      |
|-------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dimensions</b>                         |      |                                                                                                                                                                                                                                                                      |
| Dimensions (W x H x D)                    | mm   | 30 x 196.5 x 117.5 (incl. terminal module)                                                                                                                                                                                                                           |
| <b>Module-specific data</b>               |      |                                                                                                                                                                                                                                                                      |
| Number of outputs, source input           |      | 6 switch-off groups (safety group 1 ... 6)                                                                                                                                                                                                                           |
| Internal power supply for bar             |      | U1                                                                                                                                                                                                                                                                   |
| Assigned address range                    |      |                                                                                                                                                                                                                                                                      |
| • In PAE                                  | byte | 5                                                                                                                                                                                                                                                                    |
| • In PAA                                  | byte | 5                                                                                                                                                                                                                                                                    |
| Maximum achievable safety class           |      |                                                                                                                                                                                                                                                                      |
| • Acc. to IEC 61508                       |      | SIL3                                                                                                                                                                                                                                                                 |
| • Acc. to VDE 0801                        |      | AK 6                                                                                                                                                                                                                                                                 |
| • Acc. to EN 954                          |      | Cat. 4                                                                                                                                                                                                                                                               |
| <b>Voltages, currents, potentials</b>     |      |                                                                                                                                                                                                                                                                      |
| Control supply voltage                    | V    | 24 DC                                                                                                                                                                                                                                                                |
| Electrical separation                     |      |                                                                                                                                                                                                                                                                      |
| • Between outputs and backplane bus       |      | Yes                                                                                                                                                                                                                                                                  |
| • Between outputs and power supply        |      | No                                                                                                                                                                                                                                                                   |
| • Between outputs                         |      | No                                                                                                                                                                                                                                                                   |
| • Between outputs/power supply and shield |      | Yes                                                                                                                                                                                                                                                                  |
| <b>Status, alarms, diagnostics</b>        |      |                                                                                                                                                                                                                                                                      |
| Status display                            |      | Green LED per SG<br>Green LED for electronics supply<br>Green LED for load voltage                                                                                                                                                                                   |
| Alarms: Diagnostic alarm                  |      | "TO"                                                                                                                                                                                                                                                                 |
| Diagnostic functions                      |      |                                                                                                                                                                                                                                                                      |
| • Group fault display                     |      | Red LED (SF)                                                                                                                                                                                                                                                         |
| • Diagnostic information can be read out  |      | Available                                                                                                                                                                                                                                                            |
| <b>Settings</b>                           |      |                                                                                                                                                                                                                                                                      |
| Module address                            |      | Diverse:<br>1. Using a safety-oriented parameter in the parameterization message frame over the backplane bus<br>2. Using the 10-pole DIL switch (binary-coded) on the left side of the module<br>The received address is then compared with the DIL switch setting. |

# SIMATIC ET 200 distributed I/O

## ET 200S

Motor starters and safety motor starters  
Safety module local and PROFIsafe

### Ordering data

|                                                                                                     | Version                                                                                                                                                                             | Order No.               |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <b>Safety modules local</b>                                                                         |                                                                                                                                                                                     |                         |
| <br>3RK1 903-3DA00 | <b>PM-D F1</b><br>With diagnostics<br>Safety module for EMERGENCY-STOP application<br>Monitored start                                                                               | F <b>3RK1 903-1BA00</b> |
|                                                                                                     | <b>PM-D F2</b><br>With diagnostics<br>Safety module for protective door monitoring<br>Automatic start                                                                               | F <b>3RK1 903-1BB00</b> |
|                                                                                                     | <b>PM-D F3</b><br>With diagnostics<br>Safety module for expanding<br>PM-D F1/2 for another voltage group<br>Time-delayed 0 to 15 s                                                  | <b>3RK1 903-1BD00</b>   |
|                                                                                                     | <b>PM-D F4</b><br>With diagnostics<br>Safety module for expanding<br>PM-D F1/2 for another voltage group                                                                            | <b>3RK1 903-1BC00</b>   |
|                                                                                                     | <b>PM-D F5</b><br>With diagnostics<br>Safety module for expanding<br>PM-D F1...4 with four floating enabling circuits<br>Contact multipliers                                        | <b>3RK1 903-1BE00</b>   |
|                                                                                                     | <b>PM-D FX1</b><br>With diagnostics<br>Infeed terminal module for supply of<br>1 to 6 switch-off groups                                                                             | F <b>3RK1 903-3DA00</b> |
|                                                                                                     | <b>FC-M contact multipliers</b><br>With 4 safe floating contacts                                                                                                                    | <b>3RK1 903-3CA00</b>   |
| <b>PROFIsafe safety modules</b>                                                                     |                                                                                                                                                                                     |                         |
|                                                                                                     | <b>PM-D F PROFIsafe safety modules</b><br>For PROFIBUS and PROFINET<br>For fail-safe motor starters<br>For fail-safe contact multipliers<br>With six switch-off groups (SG1 to SG6) | F <b>3RK1 903-3BA01</b> |
|                                                                                                     | <b>F-CM contact multipliers</b><br>With 4 safe floating contacts                                                                                                                    | <b>3RK1 903-3CA00</b>   |

F: Subject to export regulations AL: N and ECCN: EAR99

**Overview*****Terminal module for safety modules PM-D F1/F2/F3/F4/F5***

For supplying load and sensor voltage to the self-assembling potential bars of the Standard motor starters, High-Feature motor starters and frequency converters. Safety modules for voltage monitoring are plugged onto TM-P modules. TM-P modules can be used any number of times within the ET 200S. A safety module must always be plugged upstream from the first motor starter.

Different safety circuits can be functionally separated or else cascaded using different terminal modules. Each group in such a case must be terminated with a PM-X connection module.

**TM-PF30 S47-B1**

The terminal module is always positioned at the beginning of a safety segment and accommodates the PM-DF1 safety module for EMERGENCY-STOP applications or the PM-DF2 safety module for protective door monitorings. The 24 V supply voltages for the electronics (U1) and those for supplying the contactors (U2) of the motor starters must be connected along with the 2-channel connection of the safety sensors (e.g. EMERGENCY-STOP pushbuttons) to this terminal module. Connections for the ON button (enabling) and safe output of the safety module are available in addition.

**TM-PF30 S47-B0**

The terminal module is used to cascade lower level safety segments and accommodates the PM-DF1 safety module for EMERGENCY-STOP applications or the PM-DF2 safety module for protective door monitorings. No other auxiliary voltage has to be connected to this terminal module. The supply comes from the preceding PM-DF1 or PM-DF2 module over the potential bars of the terminal modules. Once the potential of the preceding safety module is disconnected, this sub-potential also has no voltage.

**TM-PF30 S47-C1**

The terminal module is always positioned at the beginning of a safety segment expansion in a new station, e.g. at an interface point. It accommodates the PM-D F3 safety module for time-delayed shutdown or the PM-D F4 safety module for direct shutdown in separately located ET 200S stations. The 24 V supply voltages for the electronics (U1) and those for supplying the contactors (U2) are fed in new. The shutdown command from an upstream ET 200S station is received through a safe input. Separate terminals are available to connect the feedback circuit to the upstream ET 200S station. No safety sensors can be connected to this terminal module.

**TM-PF30 S47-C0**

The terminal module is used to cascade lower level safety segments and accommodates the PM-D F3 safety module for time-delayed shutdown or the PM-D F4 safety module. Only the U2 supply voltage for the contactors must be connected to this terminal module. The U1 supply comes from the preceding safety module (sub-potential group) over the potential bars of the terminal modules. No safety sensors can be connected to this terminal module.

**TM-PF30 S47-D0**

The terminal module is used to accommodate the PM-D F5 safety module. On this terminal module, safe signals can be relayed to external systems through four groups, each with two safety relay contacts configured with redundancy. The terminal module must always be positioned between one of the above mentioned terminal modules and a terminal module for the TM-X connection module. No safety sensors can be connected to this terminal module.

***Terminal modules for PM-X safety module (TM-X)*****TM-X15 S27-01**

For connection of an external infeed contactor (second shutdown option) for category 3 and 4. The connection module (PM-X Safety Module) is plugged on the right alongside the last motor starter of a safety segment. On the TM-X terminal module there are the terminals for connecting the positively driven NC contact of the contactors as well as the terminals for connecting the contactor coil. If no contactor with redundant switching is required, e.g. for category 2 (ISO 13849-1), the feedback circuit has to be closed at these terminals with a jumper. In applications with external safety relays it is also used instead of the safety module as interface to the external safety relay.



# SIMATIC ET 200 distributed I/O

## ET 200S

### Terminal modules for safety modules local and PROFIsafe

#### Technical specifications

| TM-PFX30 S47/TM-PF30 S47 terminal module      |                 |                                                       |
|-----------------------------------------------|-----------------|-------------------------------------------------------|
| <b>Dimensions</b>                             |                 |                                                       |
| Mounting dimensions (W x H x D)               | mm              | 30 x 196.5 x 102                                      |
| Depth with power module                       | mm              | 117.5                                                 |
| <b>Insulation voltages and rated currents</b> |                 |                                                       |
| Insulation voltage                            | V               | 500                                                   |
| Rated operational voltage                     | V               | 24 DC                                                 |
| Rated operational current                     | A               | 10                                                    |
| <b>Conductor cross-sections</b>               |                 |                                                       |
| Solid                                         | mm <sup>2</sup> | 1 x (0.14 ... 2.5), according to IEC 60947<br>1 x 2.5 |
| Finely stranded with end sleeve               | mm <sup>2</sup> | 1 x (0.14 ... 1.5), according to IEC 60947            |
| AWG cables, solid or stranded                 | AWG             | 1 x (18 ... 22)                                       |
| <b>Wiring</b>                                 |                 |                                                       |
| Required tool                                 |                 | Standard screwdriver size 1                           |
| Tightening torque                             | Nm              | 0.4 ... 0.7                                           |

#### Ordering data

| Version                                                                                                 | Order No.        |
|---------------------------------------------------------------------------------------------------------|------------------|
| <b>Terminal modules for safety modules local</b>                                                        |                  |
| <b>Terminal modules</b>                                                                                 |                  |
| <b>TM-PF30 S47-B1</b><br>For PM-D F1/2 Safety Modules<br>With infeed U1/U2 and sensor connection        | F 3RK1 903-1AA00 |
| <b>TM-PF30 S47-B0</b><br>For PM-D F1/2 Safety Modules<br>With sensor connection                         | F 3RK1 903-1AA10 |
| <b>TM-PF30 S47-C1</b><br>For PM-D F3/4 Safety Modules<br>With infeed U1/U2<br>and control input IN+/IN- | F 3RK1 903-1AC00 |
| <b>TM-PF30 S47-C0</b><br>For PM-D F3/4 Safety Modules<br>With infeed U2                                 | 3RK1 903-1AC10   |
| <b>TM-PF30 S47-D0</b><br>For PM-D F5 Safety Modules                                                     | 3RK1 903-1AD10   |
| <b>TM-X15 S27-01</b><br>For PM-X Safety Module                                                          | F 3RK1 903-1AB00 |
| <b>TM-P15-S27-01 terminal module</b><br>For PM-D power module                                           | 3RK1 903-0AA00   |
| <b>TM-PFX30 S47-G0/G1 terminal module</b><br>For PM-D FX1 safety modules (infeed terminal module)       |                  |
| • Infeed left (TM-PFX30 S47-G0)                                                                         | F 3RK1 903-3AE10 |
| • Infeed center (TM-PFX30 S47-G1)                                                                       | F 3RK1 903-3AE00 |
| <b>TM-FCM30 S47-F01 terminal module</b><br>For F-CM contact multipliers                                 | 3RK1 903-3AB10   |
| <b>Terminal modules for Safety modules PROFIsafe</b>                                                    |                  |
| <b>TM-PF30 S47-F0 terminal module</b><br>For PM-D F PROFIsafe safety modules                            | F 3RK1 903-3AA00 |
| <b>TM-FCM30 S47-F01 terminal module</b><br>For F-CM contact multipliers                                 | 3RK1 903-3AB10   |

F: Subject to export regulations AL: N and ECCN: EAR99

**Overview****Accessories for Standard motor starters**Control kit

The control kit for the Standard motor starter provides the possibility of testing the motor during start-up or service by actuating the motor starter protector. Using the control kit with the motor starter protector tripped, the contactor is mechanically locked in ON position.

Control unit

With the control unit the contactor coils of the Standard motor starter can be directly controlled using 24 V DC. The motor starter can thus be started as normal using a on-site control point without PLC or bus.

Note:

*The control unit cannot be used in combination with the safety system or a brake control module.*

DM-V15 distance module

- Passive module without bus connection and terminals
- Does not need a separate terminal module
- Follows a TM-DS45 or TM-RS90 or TM-xB if required
- Does not need to be taken into account when configuring the GSD file

The distance module is available for applications with high motor currents or high ambient temperatures involving Standard motor starters. It can be used to the right and left of a DS1-x direct-on-line starter or to the right of an xB1-4 brake module in order to improve heat removal to the side. The distance module is a completely passive module and does not need to be taken into account with regard to the control system during configuration. Details of the distance module can be found in the manual "SIMATIC ET 200S". If you have any queries concerning the use of the distance module, contact the Technical Support for Siemens Industrial Controls (fax: +49(0)911/895-5907).

**Accessories for High-Feature motor starters**2DI 24 V DC COM control module

The 2DI 24 V DC COM control module is plugged onto the interface on the front of the motor starter. The module provides two inputs which can receive signals from the process and be assigned directly to the starter.

The functionality can be selected from a list of various control functions as part of the PROFIBUS parameterization. On-site control point, emergency start and quick stop, for example, are available as functions. The signal levels can also be parameterized (NO/NC). For more extensive control functions the two inputs of a xB3 or x4 brake control module, which is plugged in alongside on the right, can be integrated in addition. The signal states of all inputs are transmitted in parallel with the internal use to the higher-level control system.

When a motor starter is replaced, the parameterization is automatically transmitted by download to the new starter. The inputs on the motor starter ensure autonomous operation, e.g. in the event of PLC failure, on the one hand and short response times through direct processing in the starter on the other hand. Another advantage results from the direct assignment of functions to modular machine concepts.

The 2DI 24 V DC COM control module has in addition a PC interface for connecting the Switch ES Motor Starter parameterization and diagnostic software (Version 2.0 and higher). The module works solely on High-Feature motor starters with ES Motor Starter interface. The Logo!-PC cable is used as connecting

cable between the 2DI 24 V DC COM control module and the High-Feature motor starter.

**Accessories for Standard and High-Feature motor starters**PE/N bridge module

PE/N bridge modules are used to bridge gaps in the PE/N bus which are caused, for example, by using brake control modules, PM-D(F) power modules or a PM-X connection module. If a bridge module is used, the supply must not be fed in anew. They are available in widths of 15 and 30 mm.

L123 bridge modules

The L123 bridge modules are used to bridge gaps in the power bus (see above). They are available in widths of 15 and 30 mm.

Brake control module

for motors with mechanical brake (see also [motor starters and safety motor starters ET 200S](#), [General data](#), [Overview](#), [section Brake Control Module](#), [page 9/140](#))

Terminal modules for brake control modules

The TM-xB terminal modules are used to accommodate the xB1, xB2, xB3 and xB4 brake control modules. The TM-xB terminal module must always follow directly after a terminal module for Standard motor starters, High-Feature motor starters or frequency converters as control of the solid-state braking switch is provided through an output of the motor starter/frequency converter. The xB215 terminal modules for the brake control modules have not only the terminals for connecting the cable for the motor brake but also the terminals of the two local acting inputs. These local inputs are not evaluated by a frequency converter, which is why the xB215 terminal module can only be switched behind a motor starter.

**Accessories for Standard, High Feature, Fail-safe**PE/N terminal block

The PE/N terminal block is required for direct connection of the protective conductor in the motor cable without intermediate terminals. It is plugged together with the terminal module for motor starters or frequency converters before the latter is mounted on the standard mounting rail. With two PE terminals and one N terminal the "F" version is connected to the "S32" terminal modules for motor starters or frequency converters. The "S" version is combined with the "S31" terminal module. The "F" terminal modules are delivered with two caps for closing the PE/N bus contacts on the final terminal module of a segment. The modules for the Standard motor starters have a width of 45 mm and the modules for the High-Feature motor starters and frequency converters have a width of 65 mm.

There is no electrical connection between the terminals of the PE/N terminal block and the integrated shielding of the frequency converter. The PE/N terminal block must therefore not be used for the shielding of the motor cable.

**Accessories for Safety Module local**

The fail-safe Kit (F-Kit) is needed for Standard motor starters in a safety segment (see [Safety Module local and PROFIsafe](#), [Overview](#), [page 9/159](#)).

## SIMATIC ET 200 distributed I/O

## ET 200S

Motor starters and safety motor starters  
Accessories

## Technical specifications

*xB1, xB2, xB3, xB4, xB5, xB6 Brake Control Modules*

|                                                                                    |                 | <b>xB1</b>                                                                                                             | <b>xB3</b>                    | <b>xB2</b>                                   | <b>xB4</b>                    | <b>xB5</b>                       | <b>xB6</b>                    |
|------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------|-------------------------------|----------------------------------|-------------------------------|
| <b>Dimensions (W x H x D)</b>                                                      | mm              | 15 x 196.5 x 125.5 including terminal module on 7.5 mm standard mounting rail                                          |                               |                                              |                               |                                  |                               |
| <b>Rated operational voltage</b>                                                   | V               | 24 DC                                                                                                                  |                               | 500 DC (min. 100)                            |                               | 400 AC                           |                               |
| <b>Energy supply</b>                                                               |                 | Externally through terminal module                                                                                     |                               | From brake rectifier through terminal module |                               | External through terminal module |                               |
| <b>Rated operational current</b>                                                   | A               | 4                                                                                                                      |                               | 0.7                                          |                               | 0.5                              |                               |
| <b>Reverse polarity protection</b>                                                 |                 | No, in the event of polarity reversal the brake is released and the overload/short-circuit protection is not effective |                               |                                              |                               | Not relevant                     |                               |
| <b>Overload/short-circuit protection</b>                                           |                 | Yes, solid-state                                                                                                       |                               |                                              |                               | 1 A safety fuse                  |                               |
| <b>Conductor cross-section of the terminal module for the brake control module</b> | mm <sup>2</sup> | 1 x 2.5 without end sleeve<br>1 x 1.5 with end sleeve                                                                  |                               |                                              |                               |                                  |                               |
| <b>Number of outputs</b>                                                           |                 | 0                                                                                                                      | 1 (used internally)           | 0                                            | 1 (used internally)           | 0                                | 1 (used internally)           |
| <b>Number of inputs</b>                                                            |                 | 0                                                                                                                      | 2                             | 0                                            | 2                             | 0                                | 2                             |
| <b>Address space needed per module</b>                                             |                 |                                                                                                                        |                               |                                              |                               |                                  |                               |
| • With summary                                                                     |                 | 0                                                                                                                      | 2 bit                         | 0                                            | 2 bit                         | 0                                | 2 bit                         |
| • Without summary                                                                  |                 | 0                                                                                                                      | 1 byte                        | 0                                            | 1 byte                        | 0                                | 1 byte                        |
| <b>Diagnostic functions</b>                                                        |                 |                                                                                                                        |                               |                                              |                               |                                  |                               |
| • Group fault "SF"                                                                 |                 | Red LED                                                                                                                |                               |                                              |                               |                                  |                               |
| • Switching state for brake "STAT"                                                 |                 | Yellow LED                                                                                                             |                               |                                              |                               |                                  |                               |
| • Inputs 1 and 5                                                                   |                 | --                                                                                                                     | Green LED                     | --                                           | Green LED                     | --                               | Green LED                     |
| <b>Parameters (default values underlined)</b>                                      |                 |                                                                                                                        |                               |                                              |                               |                                  |                               |
| • Brake overload diagnostics                                                       |                 | --                                                                                                                     | Disable/Enable                | --                                           | Disable/Enable                | --                               |                               |
| • Input delay                                                                      | ms              | --                                                                                                                     | 0 / 0.1 / 0.5 / <u>3</u> / 15 | --                                           | 0 / 0.1 / 0.5 / <u>3</u> / 15 | --                               | 0 / 0.1 / 0.5 / <u>3</u> / 15 |

## Ordering data

|                                                                                                                                                                                                                                                                                                                                  | Version                                                                                                                                   | Order No.             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>Accessories for Standard motor starters</b>                                                                                                                                                                                                                                                                                   |                                                                                                                                           |                       |
| <br>3RK1 903-OCA00<br><br><br>3RK1 903-OCG00<br><br><br>3RK1 903- OCD00 | <b>Control kit</b><br>for manually operating the contactor contacts during start-up and servicing<br>(one set contains five control kits) | <b>3RK1 903-OCA00</b> |
|                                                                                                                                                                                                                                                                                                                                  | <b>Control unit</b><br>for direct contactor control<br>(manual control)<br>24 V DC                                                        | <b>3RK1 903-OCG00</b> |
|                                                                                                                                                                                                                                                                                                                                  | <b>DM-V15 distance module</b><br>for DS1-x direct-on-line starters with<br>high temperatures or high current loading<br>15 mm wide        | <b>3RK1 903-OCD00</b> |

## Ordering data (continued)

| Version                                                                                               |                                                                                                                                                                                                                                                                                                                                                                      | Order No.           |
|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>Accessories for Standard motor starters</b>                                                        |                                                                                                                                                                                                                                                                                                                                                                      |                     |
| <br>3RK1 903-2AA00   | <b>PE/N M45-PEN-F terminal block</b><br>45 mm wide<br>including two caps<br>in combination with TM-DS45-S32 /<br>TM-RS90-S32                                                                                                                                                                                                                                         | 3RK1 903-2AA00      |
|                                                                                                       | <b>PE/N M45-PEN-S terminal block</b><br>45 mm wide<br>in combination with TM-DS45-S31 /<br>TM-RS90-S31                                                                                                                                                                                                                                                               | 3RK1 903-2AA10      |
| <b>Accessories for High-Feature motor starters</b>                                                    |                                                                                                                                                                                                                                                                                                                                                                      |                     |
| <br>3RK1 903-0CH20  | <b>2DI LC COM control module</b><br>Digital input module with 2 inputs (cable length up to 100 m) for local motor starter functions for mounting onto the front of motor starters, operational voltage 24 V DC (supplied from $U_1$ ), short-circuit proof, floating contact with serial interface for connecting motor starters ES, connection using LOGO!-PC cable | F 3RK1 903-0CH20    |
|                                                                                                       | <b>LOGO! PC cable</b><br>for connecting the High-Feature motor starter with ES interface switch to a PC                                                                                                                                                                                                                                                              | 6ED1 057-1AA00-0BA0 |
| <br>3RK1 922-3BA00 | <b>Hand-held device</b><br>for ET 200S High-Feature motor starters, (also for ET 200pro and ECOFAST), for on-site operation.<br>A serial interface cable must be ordered separately.                                                                                                                                                                                 | 3RK1 922-3BA00      |
| <b>Accessories for Standard / High-Feature motor starters</b>                                         |                                                                                                                                                                                                                                                                                                                                                                      |                     |
| <br>3RK1 903-0AH00 | <b>M15-PE/N bridge module</b><br>15 mm wide<br>for bridging a 15 mm module                                                                                                                                                                                                                                                                                           | 3RK1 903-0AH00      |
|                                                                                                       | <b>M30-PE/N bridge module</b><br>30 mm wide<br>for bridging a 30 mm module                                                                                                                                                                                                                                                                                           | 3RK1 903-0AJ00      |
| <br>3RK1 903-0AJ00 |                                                                                                                                                                                                                                                                                                                                                                      |                     |

F: Subject to export regulations AL: N and ECCN: EAR99

# SIMATIC ET 200 distributed I/O

## ET 200S

### Motor starters and safety motor starters Accessories

#### Ordering data (continued)

|                                                                                                      | Version                                                                                                                                                                   | Order No.                                                                                                                              |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Accessories for Standard motor starters</b>                                                       |                                                                                                                                                                           |                                                                                                                                        |
| <br>3RK1 903-0AE00  | <b>M15-L123 bridge module</b><br>15 mm wide<br>for bridging a 15 mm module                                                                                                | 3RK1 903-0AE00                                                                                                                         |
|                                                                                                      | <b>M30-L123 bridge module</b><br>30 mm wide<br>for bridging a 30 mm module                                                                                                | 3RK1 903-0AF00                                                                                                                         |
|                                                                                                      | <b>Sealing caps</b><br>for L123 bridge modules and PE/N                                                                                                                   | 3RK1 903-0AF20                                                                                                                         |
| <br>3RK1 903-0CB00 | <b>Brake control modules</b><br>for motors with mechanical brakes                                                                                                         |                                                                                                                                        |
|                                                                                                      | <ul style="list-style-type: none"> <li>• <b>xB1 for motor starters</b><br/>24 V DC/4 A</li> </ul>                                                                         | F 3RK1 903-0CB00                                                                                                                       |
|                                                                                                      | <ul style="list-style-type: none"> <li>• <b>xB2 for motor starters</b><br/>500 V DC/0.7 A</li> </ul>                                                                      | 3RK1 903-0CC00                                                                                                                         |
|                                                                                                      | <ul style="list-style-type: none"> <li>• <b>xB3 for motor starters</b><br/>24 V DC / 4 A / 2 DI 24 V DC local control<br/>with diagnostics, with two inputs</li> </ul>    | F 3RK1 903-0CE00                                                                                                                       |
|                                                                                                      | <ul style="list-style-type: none"> <li>• <b>xB4 for motor starters</b><br/>500 V DC / 0.7 A / 2 DI 24 V DC local control<br/>with diagnostics, with two inputs</li> </ul> | F 3RK1 903-0CF00                                                                                                                       |
|                                                                                                      | <ul style="list-style-type: none"> <li>• <b>xB5 for motor starter</b><br/>400 V AC<br/>without digital input</li> </ul>                                                   | 3RK1 903-0CJ00                                                                                                                         |
|                                                                                                      | <ul style="list-style-type: none"> <li>• <b>xB6 for motor starter</b><br/>400 V AC<br/>with two digital inputs</li> </ul>                                                 | 3RK1 903-0CK00                                                                                                                         |
|                                                                                                      | <b>Terminal modules for brake control modules</b>                                                                                                                         |                                                                                                                                        |
|                                                                                                      | <ul style="list-style-type: none"> <li>• <b>TM-xB15 S24-01</b><br/>for xB1 or xB2</li> </ul>                                                                              | 3RK1 903-0AG00                                                                                                                         |
|                                                                                                      | <ul style="list-style-type: none"> <li>• <b>TM-xB215 S24-01</b><br/>for xB3 or xB4</li> </ul>                                                                             | F 3RK1 903-0AG01                                                                                                                       |
| <b>Accessories for fail-safe motor starters</b>                                                      |                                                                                                                                                                           |                                                                                                                                        |
|                                                                                                      | <b>PE/N M65-PEN-F terminal blocks</b><br>With incoming connection, with caps                                                                                              | 3RK1 903-2AC00                                                                                                                         |
|                                                                                                      | <b>M65-PEN-S terminal blocks</b><br>without incoming connection                                                                                                           | 3RK1 903-2AC10                                                                                                                         |
| <b>Accessories for power module</b>                                                                  |                                                                                                                                                                           |                                                                                                                                        |
|                                                                                                      | <b>Color coding plates</b><br>6 x 200 color coding plates for terminal modules<br>One set contains 10 strips of 20 color coding plates per color                          |                                                                                                                                        |
|                                                                                                      | <ul style="list-style-type: none"> <li>• White</li> <li>• Yellow</li> <li>• Yellow and green</li> <li>• Red</li> <li>• Blue</li> <li>• Brown</li> </ul>                   | 6ES7 193-4LA10-0AA0<br>6ES7 193-4LB10-0AA0<br>6ES7 193-4LC10-0AA0<br>6ES7 193-4LD10-0AA0<br>6ES7 193-4LF10-0AA0<br>6ES7 193-4LG10-0AA0 |

F: Subject to export regulations AL: N and ECCN: EAR99

Ordering data (continued)

| Version                                                                                                                   |                                                                                                                                                                                                                                            | Order No.               |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Accessories for safety modules local                                                                                      |                                                                                                                                                                                                                                            |                         |
| <br>3RK1 903-1CA00<br><br>3RK1 903-1CA01 | <b>PM-X safety module (connection module)</b><br>With diagnostics, plugged-in on TM-X15 S27-01<br>Module for connecting a safety group and for connecting an external infeed contactor or for the connection to an external safety circuit | F <b>3RK1 903-1CB00</b> |
|                                                                                                                           | <b>F-Kit 1</b><br>Fail-safe equipment for DS1-x <sup>1)</sup> Standard motor starters                                                                                                                                                      | F <b>3RK1 903-1CA00</b> |
|                                                                                                                           | <b>F-Kit 2</b><br>Fail-safe equipment for RS1-x <sup>1)</sup> Standard motor starters                                                                                                                                                      | F <b>3RK1 903-1CA01</b> |

<sup>1)</sup> The function of the fail-safe kit is already integrated into High-Feature motor starters.

F: Subject to export regulations AL: N and ECCN: EAR99

## SIMATIC ET 200 distributed I/O

## ET 200S

Frequency converters  
ET 200S FC frequency converter

## Overview



Components of the ET 200S FC frequency converter

## Application

- New application possibilities are opened up for the ET 200S system where permanent control of the speed of asynchronous motors is required.
- The frequency converter handles frequency control and vector control for more complex drive tasks. In addition, the converter also supports torque control for conveyor applications, winding and unwinding drives, as well as hoisting gear. Together with a motor encoder, the range extends up to closed-loop controls for exact control of speeds and torques.
- The advantages of line-commutated power regeneration are primarily evident in continuous regenerative operation. Examples include unwinding units, lowering of loads with hoisting gear, or electric braking of large centrifugal masses.
- Together with an intelligent header module (IM 151 CPU) and the ET 200S FC frequency converter, the I/O station is expanded to become a complete automation solution for machine modules and plant sections.

## Technical specifications

|                                                                                                                 | Control unit                                                                                                                                                                                                                                                                |                                  | Converter power modules     |        |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------|--------|
|                                                                                                                 | ICU24                                                                                                                                                                                                                                                                       | IPM25, FS A<br>Frame size A      | IPM25, FS B<br>Frame size B |        |
| <b>Selection features</b>                                                                                       |                                                                                                                                                                                                                                                                             |                                  |                             |        |
| Integral safety functions according to Category 3 of EN 954-1 or according to SIL2 of IEC 61508                 | -                                                                                                                                                                                                                                                                           | -                                | -                           |        |
| Output                                                                                                          | -                                                                                                                                                                                                                                                                           | 0.75 kW                          | 2.2 kW                      | 4.0 kW |
| Rated input current (at 50° C ambient temperature)                                                              | -                                                                                                                                                                                                                                                                           | 1.9 A                            | 5.7 A                       | 9.6 A  |
| Rated output current (at 50° C ambient temperature)                                                             | -                                                                                                                                                                                                                                                                           | 2.1 A                            | 5.9 A                       | 10.2 A |
| Mounting dimensions (W x H x D) in mm (including terminal module)                                               | 15 x 220 x 156                                                                                                                                                                                                                                                              | 65 x 290 x 156                   | 130 x 290 x 156             |        |
| <b>Electrical data</b>                                                                                          |                                                                                                                                                                                                                                                                             |                                  |                             |        |
| Line voltage                                                                                                    | 380 V to 480 V 3 AC +10 % / -10 %                                                                                                                                                                                                                                           |                                  |                             |        |
| Line frequency                                                                                                  | 47 Hz to 63 Hz                                                                                                                                                                                                                                                              |                                  |                             |        |
| Overload capability                                                                                             | <ul style="list-style-type: none"> <li>• Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 60 s, cycle time 300 s</li> <li>• Overload current 2 x rated output current (i.e. 200 % overload capability) for 3 s, cycle time 300 s</li> </ul> |                                  |                             |        |
| Output frequency                                                                                                | 0 Hz to 650 Hz                                                                                                                                                                                                                                                              |                                  |                             |        |
| Pulse frequency                                                                                                 | 8 kHz (standard), 2 kHz to 16 kHz (in 2 kHz steps)                                                                                                                                                                                                                          |                                  |                             |        |
| Standard short circuit current rating SCCR (Short Circuit Current Rating) <sup>1)</sup>                         | 10 kA                                                                                                                                                                                                                                                                       |                                  |                             |        |
| Skipped frequency range                                                                                         | 1, programmable                                                                                                                                                                                                                                                             |                                  |                             |        |
| Converter efficiency                                                                                            | ≥96 % at rated load of the motor                                                                                                                                                                                                                                            |                                  |                             |        |
| Typical power loss at 420 V input voltage <sup>2)</sup> and motor with rated load (motor and regenerative mode) | 10 W                                                                                                                                                                                                                                                                        | 40 W<br>(Pulse frequency 8 kHz)  | 110 W                       | 160 W  |
|                                                                                                                 |                                                                                                                                                                                                                                                                             | 65 W<br>(Pulse frequency 16 kHz) | 140 W                       | 200 W  |
|                                                                                                                 |                                                                                                                                                                                                                                                                             | 30 W<br>(Pulse frequency 4 kHz)  | 80 W                        | 130 W  |
| Typical power loss at 420 V input voltage <sup>2)</sup> and motor during no-load operation, 50 Hz               | 10 W                                                                                                                                                                                                                                                                        | 35 W<br>(Pulse frequency 8 kHz)  | 70 W                        | 110 W  |

<sup>1)</sup> Applies to industrial industrial control cabinet installations according to NEC Article 409 / UL 508A.

<sup>2)</sup> The power loss varies according to the input voltage.

**Technical specifications** (continued)

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interfaces                | <ul style="list-style-type: none"> <li>• Connection to PROFIBUS or PROFINET over the ET 200S backplane bus</li> <li>• RS232 interface with USS protocol for commissioning on the PC using the STARTER commissioning software</li> <li>• Slot for an optional memory card (MMC) for uploading or downloading parameter settings</li> <li>• PTC/KTY84 interface for motor temperature monitoring</li> <li>• Speed sensor interface (Sub-D connector) for unipolar HTL incremental position encoder</li> </ul> |
| <b>Functions</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Control method            | <ul style="list-style-type: none"> <li>• V/f control – linear (<math>M \sim n</math>) with/without flux current control (FCC), quadratic (<math>M \sim n^2</math>) or parameterizable</li> <li>• Vector control – with or without encoder</li> <li>• Torque control</li> </ul>                                                                                                                                                                                                                              |
| Operating functions       | Jogging mode, free function blocks (FFB), positioning deceleration ramp, automatic restart following interruption due to power failure, bumpless connection of converter to rotating motor                                                                                                                                                                                                                                                                                                                  |
| Braking functions         | <ul style="list-style-type: none"> <li>• Regenerative braking operation without brake chopper and pulsed resistor</li> <li>• Control of an electrical holding brake via an optional Brake Control Module</li> </ul>                                                                                                                                                                                                                                                                                         |
| Protection features for   | Undervoltage, overvoltage, ground faults, short circuits, stall prevention, thermal motor protection $F_t$ , converter overtemperature, motor blocking protection                                                                                                                                                                                                                                                                                                                                           |
| Connectable motors        | <ul style="list-style-type: none"> <li>• Low-voltage asynchronous motors</li> <li>• Motor cable lengths: max. 50 m (shielded) max. 100 m (unshielded)<br/>If an output reactor or an LC filter is used, longer cable lengths are possible</li> </ul>                                                                                                                                                                                                                                                        |
| <b>Mechanical data</b>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Degree of protection      | IP20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Operating temperature     | • With vertical design of station -10 °C to + 40 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                           | • With horizontal design of station -10 °C to + 50 °C/to +60 °C with derating                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Standards</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Compliance with standards | UL, cUL, CE, c-tick, according to low-voltage directive 2006/95/EG, EMC directive 89/336/EEC                                                                                                                                                                                                                                                                                                                                                                                                                |

**Derating data**Pulse frequency

| Output | Rated output current in A at a pulse frequency of |       |       |       |        |        |        |        |
|--------|---------------------------------------------------|-------|-------|-------|--------|--------|--------|--------|
| kW     | 2 kHz                                             | 4 kHz | 6 kHz | 8 kHz | 10 kHz | 12 kHz | 14 kHz | 16 kHz |
| 0.75   | 2.1                                               | 2.1   | 2.1   | 2.1   | 1.05   | 1.05   | 1.05   | 1.05   |
| 2.2    | 5.9                                               | 5.9   | 5.9   | 5.9   | 5.3    | 5.3    | 5.3    | 5.3    |
| 4.0    | 10.2                                              | 10.2  | 10.2  | 10.2  | 5.1    | 5.1    | 5.1    | 5.1    |

The current data apply to an ambient temperature of 50 °C unless specified otherwise.

**Ordering data****Order No.****ICU24 control unit**

- Control modes: V/f, FCC, SLVC, VC with encoder, torque control
- Motor encoder input: HTL unipolar
- Motor temperature input: PTC/KTY

F **6SL3 244-0SA00-1AA1****IPM25 converter power module**

380 V – 480 V 3 AC +10/-10 %  
47 Hz - 63 Hz

Overload:  
150 % 60 s  
200 % 3 s

Power:  
0.75 kW

E **6SL3 225-0SE17-5UA3**

E: Subject to export regulations AL: 9I999 and ECCN: EAR99

F: Subject to export regulations AL: N and ECCN: EAR99



## SIMATIC ET 200 distributed I/O

## ET 200S

Frequency converters  
ET 200S FC frequency converter

## Ordering data

## Order No.



## IPM25 converter power module

380 V – 480 V 3 AC +10/-10 %  
47 Hz - 63 Hz

Overload:  
150 % 60 s  
200 % 3 s

Power:

2.2 kW

4.0 kW

E 6SL3 225-0SE22-2UA3

E 6SL3 225-0SE24-0UA3

## Necessary components and accessories:

## Accessories

## Order No.

## Order No.

## TM-ICU15 terminal module

for IC24/ICU24F Control Unit

3RK1 903 3EA10

## TM-IPM65 terminal module

for IPM25 power unit, 0.75 kW of frequency converter

- with supply cable connection for power bus (TM-IPM65-S32)
- without supply cable connection for power bus (TM-IPM65-S31)

3RK1 903-3EC00

3RK1 903-3EC10

## TM-IPM130 terminal module

for IPM25 power unit, 2.2 kW and 4.0 kW of frequency converter

- with supply cable connection for power bus (TM-IPM130-S32)
- without supply cable connection for power bus (TM-IPM130-S31)

3RK1 903-3ED00

3RK1 903-3ED10

## EMC filter for frequency converter

connected upstream of common power bus of the frequency converter in order to achieve EMC class A, EMC-compliant design with shielded motor cables necessary

- 25 A rated current
- 50 A rated current

F 6SL3 203-0BE22-5AA0

F 6SL3 203-0BE25-0AA0

## Output reactor for IPM25 power unit

- 0.75 kW
- 2.2 kW and 4.0 kW

6SE6 400-3TC00-4AD2

6SE6 400-3TC01-0BD3

## LC filter for IPM25 power unit

- 0.75 kW
- 2.2 kW and 4.0 kW

6SE6 400-3TD00-4AD0

6SE6 400-3TD01-0BD0

## Brake control modules

for motors with mechanical brake  
See also page 9/169 ff.

- xB1 for frequency converter 24 V DC / 4 A
- xB2 for frequency converter 500 V DC / 0.7 A

F 3RK1 903-0CB00

3RK1 903-0CC00

## Terminal module for brake control modules

- TM-xB15 S24-01 for xB1 or xB2  
See also page 9/172

3RK1 903-0AG00

## RS232/null-modem cable (5 m)

Connecting cable for commissioning the ET 200S FC frequency converter with the "STARTER" PC tool

6ES7 901-1BF00-0XA0

## PM-D power module

for 24 V DC with diagnostics  
See also page 9/152

F 3RK1 903-0BA00

## TM-P15 S27-01 terminal module

for PM-D power module  
See also page 9/153

3RK1 903-0AA00

## MMC parameter memory for frequency converter

suitable for MMC slot of the ICU24 / ICU24F Control Unit; other memory cards not accepted

E 6SL3 254-0AM00-0AA0

## IOP Handheld

for use with SIMATIC ET 200S FC frequency converter or SIMATIC ET 200pro FC Included in the scope of delivery:

- IOP
- Handheld housing
- Batteries (4 AA)
- Charger (international)
- RS232 connecting cable (Length 3 m, can only be used for SINAMICS G120 and SIMATIC ET 200S FC)
- USB cable (length 1 m)

E 6SL3 255-0AA00-4HA0

E: Subject to export regulations AL: 91999 and ECCN: EAR99

F: Subject to export regulations AL: N and ECCN: EAR99

# SIMATIC ET 200 distributed I/O

## ET 200S

### Frequency converters

#### ET 200S FC fail-safe frequency converter

#### Overview



Components of the ET 200S FC fail-safe frequency converter

#### Application

- When stepless speed control of induction motors is required, new applications are opened up for the ET 200S system.
- The frequency converter handles both frequency control and vector control for more complex drive tasks. In addition, the converter also supports torque control in conveyor applications, winding and unwinding drives as well as hoists. With a motor encoder, the range also includes closed-loop control for precise speed and torque control.
- The advantages of the line-commutated energy feedback are primarily evident in continuous regenerative operation. Examples include unwinding units, lowering of loads with hoisting gear, or electric braking of large centrifugal masses.
- In combination with an intelligent module head (IM 151 CPU) and the ET 200S FC frequency converter, the I/O station matures to a complete automation solution for machine modules and plant sections.
- The integrated safety functions considerably reduce the overhead for drive solutions in plant sections which pose a potential danger. Monitoring of the safely reduced speed in encoderless standard induction motors is unique in drive engineering.

#### Technical specifications

|                                                                                                   | Control unit                                                                                                                                                                                                                                          | Converter Power Modules     |                             |
|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|
|                                                                                                   | ICU24F                                                                                                                                                                                                                                                | IPM25, FS A<br>Frame size A | IPM25, FS B<br>Frame size B |
| <b>Selection features</b>                                                                         |                                                                                                                                                                                                                                                       |                             |                             |
| • Integral safety functions according to Category 3 of EN 954-1 or according to SIL2 of IEC 61508 | • Safe Torque Off (STO)<br>• Safely Limited Speed (SLS) <sup>1)</sup><br>• Safe Stop 1 (SS1) <sup>1)</sup>                                                                                                                                            | -                           | -                           |
| • Output                                                                                          | -                                                                                                                                                                                                                                                     | 0.75 kW                     | 2.2 kW                      |
| • Rated input current (at 50 °C ambient temperature)                                              | -                                                                                                                                                                                                                                                     | 1.9 A                       | 5.7 A                       |
| • Rated output current (at 50 °C ambient temperature)                                             | -                                                                                                                                                                                                                                                     | 2.1 A                       | 5.9 A                       |
| • Mounting dimensions (W x H x D) in mm (including terminal module)                               | 15 x 220 x 156                                                                                                                                                                                                                                        | 65 x 290 x 156              | 130 x 290 x 156             |
| <b>Electrical data</b>                                                                            |                                                                                                                                                                                                                                                       |                             |                             |
| Line voltage                                                                                      | 380 V to 480 V 3 AC + 10 %/-10 %                                                                                                                                                                                                                      |                             |                             |
| Line frequency                                                                                    | 47 Hz to 63 Hz                                                                                                                                                                                                                                        |                             |                             |
| Overload capability                                                                               | <ul style="list-style-type: none"> <li>• Overload current 1.5 x rated output current (i.e. 150 % overload) for 60 s, cycle time 300 s</li> <li>• Overload current 2 x rated output current (i.e. 200 % overload) for 3 s, cycle time 300 s</li> </ul> |                             |                             |
| Output frequency                                                                                  | 0 Hz to 650 Hz                                                                                                                                                                                                                                        |                             |                             |
| Pulse frequency                                                                                   | 8 kHz (standard), 2 kHz to 16 kHz (in 2 kHz steps)                                                                                                                                                                                                    |                             |                             |
| Standard short circuit current rating SCCR (Short Circuit Current Rating) <sup>2)</sup>           | 10 kA                                                                                                                                                                                                                                                 |                             |                             |
| Skipped frequency range                                                                           | 1, programmable                                                                                                                                                                                                                                       |                             |                             |
| Converter efficiency                                                                              | ≥96 % at rated load of the motor                                                                                                                                                                                                                      |                             |                             |

<sup>1)</sup> The safety functions "Safely Limited Speed" and "Safe Stop 1" are certified for asynchronous motors without encoders - these safety functions are not permitted for pull-through loads as in the case of lifting gear and winders.

<sup>2)</sup> Applies to industrial control cabinet installations according to NEC Article 409 / UL 508A.

# SIMATIC ET 200 distributed I/O

## ET 200S

### Frequency converters ET 200S FC fail-safe frequency converter

#### Technical specifications (continued)

|                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                        |                                |                                 |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------|
| Typical power loss at 420 V input voltage <sup>1)</sup> and motor with rated load (motor and regenerative mode) | 10 W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 40 W<br>(Pulse frequency 8 kHz)<br>65 W<br>(Pulse frequency 16 kHz)<br>30 W<br>(Pulse frequency 4 kHz) | 110 W<br><br>140 W<br><br>80 W | 160 W<br><br>200 W<br><br>130 W |
| Typical power loss at 420 V input voltage <sup>1)</sup> and motor during no-load operation, 50 Hz               | 10 W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 35 W<br>(Pulse frequency 8 kHz)                                                                        | 70 W                           | 110 W                           |
| Interfaces                                                                                                      | <ul style="list-style-type: none"> <li>• Connection to PROFIBUS or PROFINET over the ET 200S backplane bus</li> <li>• RS232 interface with USS protocol for commissioning on the PC using the STARTER commissioning software</li> <li>• Activation of the integrated safety functions via PROFIsafe (PM-D F PROFIsafe) or terminals (PM-D F X1)</li> <li>• Slot for an optional memory card (MMC) for uploading or downloading parameter settings</li> <li>• PTC/KTY84 interface (Sub-D connector) for motor temperature monitoring</li> <li>• Speed sensor interface (Sub-D connector) for unipolar HTL incremental position encoder</li> </ul> |                                                                                                        |                                |                                 |

#### Functions

|                                         |                                                                                                                                                                                                                                                                                |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Open-loop/closed-loop control procedure | <ul style="list-style-type: none"> <li>• V/f control – linear (<math>M \sim n</math>) with/without flux current control (FCC), quadratic (<math>M \sim n^2</math>) or parameterizable</li> <li>• Vector control – with or without encoder</li> <li>• Torque control</li> </ul> |
| Operating functions                     | Jogging mode, free function blocks (FFB), positioning deceleration ramp, automatic restart following interruption due to power failure, bumpless connection of converter to rotating motor                                                                                     |
| Braking functions                       | <ul style="list-style-type: none"> <li>• Regenerative braking operation without brake chopper and pulse resistor</li> <li>• Control of an electromechanical holding brake via an optional Brake Control Module</li> </ul>                                                      |
| Protective functions                    | Undervoltage, overvoltage, ground faults, short circuits, stall prevention, motor thermal protection ( $I^2t$ , or sensor) inverter overtemperature, motor blocking protection                                                                                                 |
| Connectable motors                      | <ul style="list-style-type: none"> <li>• Low-voltage asynchronous motors</li> <li>• Motor cable lengths: max. 50 m (shielded) max. 100 m (unshielded)<br/>If an output reactor or an LC filter is used, longer cable lengths are possible</li> </ul>                           |

#### Mechanical data

|                       |                                   |                                          |  |
|-----------------------|-----------------------------------|------------------------------------------|--|
| Degree of protection  | IP20                              |                                          |  |
| Operating temperature | With vertical design of station   | -10 °C to +40 °C                         |  |
|                       | With horizontal design of station | -10 °C to +50 °C/to +60 °C with derating |  |

#### Standards

|                           |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| Compliance with standards | UL, cUL, CE, c-tick, low-voltage directive 73/23/EEC, EMC directive 89/336/EEC |
|---------------------------|--------------------------------------------------------------------------------|

<sup>1)</sup> The power loss varies according to the input voltage.

#### Derating data

##### Pulse frequency

| Output | Rated output current in A at a pulse frequency of |       |       |       |        |        |        |        |
|--------|---------------------------------------------------|-------|-------|-------|--------|--------|--------|--------|
|        | 2 kHz                                             | 4 kHz | 6 kHz | 8 kHz | 10 kHz | 12 kHz | 14 kHz | 16 kHz |
| 0.75   | 2.1                                               | 2.1   | 2.1   | 2.1   | 1.05   | 1.05   | 1.05   | 1.05   |
| 2.2    | 5.9                                               | 5.9   | 5.9   | 5.9   | 5.3    | 5.3    | 5.3    | 5.3    |
| 4.0    | 10.2                                              | 10.2  | 10.2  | 10.2  | 5.1    | 5.1    | 5.1    | 5.1    |

The current data apply to an ambient temperature of 50 °C unless specified otherwise.

## Ordering data

## Order No.

**ICU24F control unit**

- Control modes: V/f, FCC, SLVC, VC with encoder, torque control
- Motor encoder input: HTL unipolar
- Motor temperature input: PTC/KTY
- Integrated safety functions

F **6SL3 244-0SA01-1AA1****IPM25 converter power module**

380 V – 480 V 3 AC +10/-10 %  
47 Hz – 63 Hz

Overload:  
150 % 60 s  
200 % 3 s

Power:  
0.75 kW

E **6SL3 225-0SE17-5UA3****IPM25 converter power module**

380 V – 480 V 3 AC +10/-10 %  
47 Hz – 63 Hz

Overload:  
150 % 60 s  
200 % 3 s

Power:  
2.2 kW  
4.0 kW

E **6SL3 225-0SE22-2UA3**E **6SL3 225-0SE24-0UA3**

E: Subject to export regulations AL: 9I999 and ECCN: EAR99

F: Subject to export regulations AL: N and ECCN: EAR99

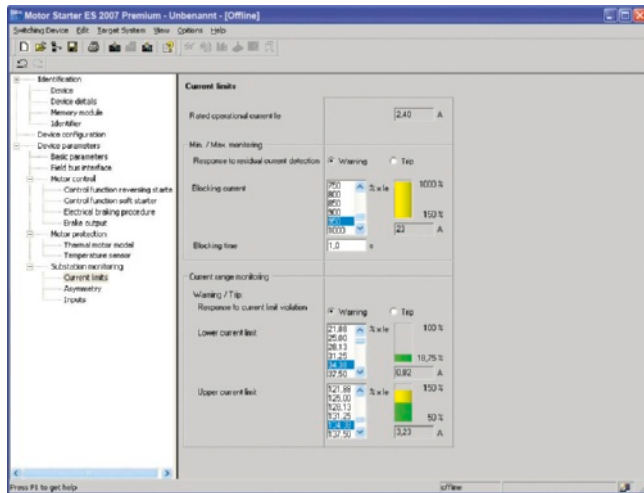
*For required components and accessories see Frequency converter ET 200S FC, page 9/176*

# SIMATIC ET 200 distributed I/O

## ET 200S

### Software Motor starter ES

#### Overview



Motor starter ES for parameterization, monitoring, diagnostics and testing of motor starters

Motor starter ES is used for start-up, parameterization, diagnostics, documentation and the preventative maintenance of the motor starters in the SIMATIC ET 200S, ET 200pro, ECOFAST and M200D product families.

Interfacing is performed

- over the local interface on the device
- with PROFIBUS DP V1 capable motor starters from any point in PROFIBUS or in PROFINET (applies for ET 200pro/ ECOFAST/M200D)
- With PROFINET capable motor starters from any point in PROFINET or in PROFIBUS (applies to M200D)

Using Motor starter ES, the communication-capable motor starters are easily parameterized during start-up, monitored during normal operation and successfully diagnosed for service purposes.

Preventative maintenance is supported by a function for reading out diverse statistical data (e.g. operating hours, operating cycles, cut-off currents, etc.). The user is supported during these procedures with comprehensive Help functions and plain text displays.

Motor starter ES can either be used as a stand-alone program or it can be integrated into STEP 7 via an object manager.

#### Types of delivery and license

Motor starter ES is available as follows:

- Floating license – the license for any one user at any one time
  - Authorizes any one user
  - Independent of the number of installations (unlike the single license which is allowed to be installed once only)
  - Only the actual use of the program has to be licensed
- Trial license (free use of all program functions for 14 days for test and evaluation purposes, included on every product CD, available in the download file of the SIRIUS ES program in the Service&Support portal).

Following delivery versions are available in addition for Motor starter ES 2007:

- Upgrade  
Switching from an old to a new version with expanded functions, e.g. upgrade from Motor starter ES 2006 to Motor Starter ES 2007
- Powerpack  
Special pack for switching within the same software version to a more powerful version with more functionality, e.g. Powerpack Motor starter ES 2007 for switching from Standard to Premium
- Software Update Service  
To keep you up to date at all times we offer a special service which supplies you automatically with all service packs and upgrades
- License Download  
User-friendly license key download from our Mall (currently only for customers from Germany) as an easy and quick way for you to receive additional licenses for your software.

#### System requirements

**ES 2007 Motor starter planning, start-up and diagnostic software**  
for ECOFAST Motor Starter, SIMATIC ET 200S High-Feature Starter, SIMATIC ET 200pro Starter and M200D (AS-i Standard, PROFIBUS, PROFINET)

|                                                         |                                                                                                                                   |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>Operating system</b>                                 | Windows XP Professional (Service Pack 2, Service Pack 3), Windows 7 Professional (32 bit), Enterprise (32 bit), Ultimate (32 bit) |
| <b>Processor</b>                                        | ≥ Pentium 800 MHz/1 GHz (Windows 7)                                                                                               |
| <b>RAM</b>                                              | ≥ 512 MB/≥ 1 GB (Windows 7)                                                                                                       |
| <b>Monitor resolution</b>                               | ≥ 1024 x 768                                                                                                                      |
| <b>Free space on hard disk</b>                          | ≥ 400 Mbyte                                                                                                                       |
| <b>CD-ROM/DVD drive</b>                                 | Yes (only for installation from CD)                                                                                               |
| <b>Serial interface (COM)</b>                           | Yes                                                                                                                               |
| <b>PC cable/parameterization cable/connection cable</b> | Yes                                                                                                                               |
| <b>PROFIBUS card/PROFIBUS processor</b>                 | Optional, for parameterization and diagnostics through PROFIBUS                                                                   |
| <b>Ethernet interface/PROFINET card</b>                 | Optional, for parameterization and diagnostics through PROFINET                                                                   |

<sup>1)</sup> Additional free storage is recommended, e.g. for page file.

**Ordering data****ES 2007 Motor starter planning, start-up and diagnostic software**

for ECOFAST Motor Starter, SIMATIC ET 200S Starter High Feature Starter, SIMATIC ET 200pro Starter and M200D (AS-i Standard, PROFIBUS, PROFINET)

| Version                                                                                                                                                                   | Order No.                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Basic Motor starter ES 2007</b>                                                                                                                                        |                            |
| <b>Floating license for one user</b><br>E-SW, software and documentation on CD,<br>3 languages (English/German/French),<br>communication via system interface             |                            |
| • License key on USB stick, class A, incl. CD                                                                                                                             | <b>3ZS1 310-4CC10-0YA5</b> |
| • License key download, class A, without CD                                                                                                                               | <b>3ZS1 310-4CE10-0YB5</b> |
| <b>Standard Motor starter ES 2007</b>                                                                                                                                     |                            |
| <b>Floating license for one user</b><br>E-SW, software and documentation on CD,<br>3 languages (English/German/French),<br>communication via system interface             |                            |
| • License key on USB stick, class A, incl. CD                                                                                                                             | <b>3ZS1 310-5CC10-0YA5</b> |
| • License key download, class A, without CD                                                                                                                               | <b>3ZS1 310-5CE10-0YB5</b> |
| <b>Premium Motor starter ES 2007</b>                                                                                                                                      |                            |
| <b>Floating license for one user</b><br>E-SW, software and documentation on CD,<br>3 languages (English/German/French),<br>communication via system interface or PROFIBUS |                            |
| • License key on USB stick, class A, incl. CD                                                                                                                             | <b>3ZS1 310-6CC10-0YA5</b> |
| • License key download, class A, without CD                                                                                                                               | <b>3ZS1 310-6CE10-0YB5</b> |

**Accessories**

| Version                                                                                                                                                                                                                                                               | Order No.                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Optional accessories</b>                                                                                                                                                                                                                                           |                            |
| <b>for ET 200S High Feature Motor starter</b>                                                                                                                                                                                                                         |                            |
| • Control module 2DI DC 24 V COM, for ET 200S High Feature starter, starter Fail-safe A                                                                                                                                                                               | F <b>3RK1 903-0CH10</b>    |
| • LOGO! PC cable                                                                                                                                                                                                                                                      | <b>6ED1 057-1AA00-0BA0</b> |
| <b>for ET 200pro and MD200D Motor starter</b>                                                                                                                                                                                                                         |                            |
| RS232 interface cable, serial data connection between ET 200pro MS/FC, M200D and Laptop/PC/PG or MS                                                                                                                                                                   | <b>3RK1 922-2BP00</b>      |
| <b>for ECOFAST High Feature Motor starter (interface cable)</b>                                                                                                                                                                                                       |                            |
| PC cable                                                                                                                                                                                                                                                              | <b>3RK1 911-0BN20</b>      |
| <b>USB-to-serial-adaptor</b>                                                                                                                                                                                                                                          | D <b>3UF7 946-0AA00-0</b>  |
| for connecting a serial PC cable (for connection to serial PC interface/RS 232) recommended for use in connection with SIMOCODE pro 3UF7, modular safety system 3RK3, soft starter 3RW44, Motor starter ET 200S/ECOFAST/ET 200pro, AS-i safety monitor, AS-i analyzer |                            |

D: Subject to export regulations AL: N and ECCN: 5D992

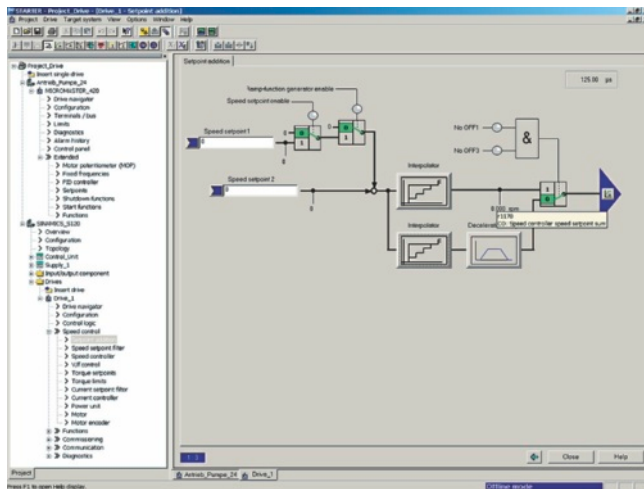
F: Subject to export regulations AL: N and ECCN: EAR99

# SIMATIC ET 200 distributed I/O

## ET 200S

### Software STARTER commissioning tool

#### Overview



The user-friendly STARTER commissioning tool can be used for:

- Commissioning,
- Optimizing and
- Diagnostics

This software can be operated either as a standalone PC application, integrated in SIMATIC STEP 7 with TIA compatibility via Drive ES Basic, or it can be integrated into the SCOUT engineering system (for SIMOTION). The basic functions and handling are the same in both cases.

In STARTER, MICROMASTER 4 devices and the SIMATIC ET 200S FC and SIMATIC ET 200pro FC frequency converters are also supported in addition to the SINAMICS drives.

The project wizards can be used to create the drives within the structure of the project tree.

Beginners are supported by solution-based dialog guidance, whereby a standard graphics-based display maximizes clarity when setting the drive parameters.

First commissioning is guided by a wizard which makes all the basic settings in the drive. Therefore, getting a motor up and running is merely a question of setting a few of the drive parameters as part of the drive configuration process.

The individual settings required are made using graphics-based parameterization screens, which also precisely visualize the principle of operation of the drive.

Examples of individual settings that can be made include:

- How terminals are used
- Bus interface
- Setpoint channel (e.g., fixed setpoints)
- Closed-loop speed control (e.g., ramp-function generator, limits)
- BICO interconnections
- Diagnostic

For experts, the expert list can be used to specifically and quickly access individual parameters at any time. An individual compilation of frequently used parameters can be saved in dedicated user lists.

In addition, the following functions are available for optimization purposes:

- Self-optimization of the controller settings (depending on drive unit)
- Trace (for SINAMICS S120 only)

Diagnostic functions provide information about:

- Control/status words
- Parameter status
- Conditions of use
- Communication states

#### Performance features

- User-friendly: only a small number of settings need to be made for successful first commissioning: The motor starts to rotate
- Solution-based dialog-based user guidance simplifies commissioning
- Self-optimization functions reduce manual effort for optimization

#### Minimum hardware and software requirements

PG or PC Pentium III min. 800 MHz (recommended > 1 GHz)

512 MB work memory (1 GB recommended)

Screen resolution 1024 × 768 pixels, 16 bit color depth

Free hard disk memory: min. 2 GB

Microsoft Windows 2000 SP4

Microsoft Windows 2003 Server SP1, SP2

Microsoft Windows XP Professional SP2, SP3

Microsoft Windows Vista Business SP1 <sup>1)</sup>

Microsoft Windows Vista Ultimate SP1 <sup>1)</sup>

Microsoft Internet Explorer V6.0 or higher

<sup>1)</sup> DCC cannot be used. STARTER can be used on these operating systems only if it does not include the DCC option.

#### Ordering data

#### Order No.

#### STARTER commissioning tool

For SINAMICS and  
MICROMASTER on DVD-ROM  
English, French, German, Italian,  
Spanish

**6SL3 072-0AA00-0AG0**



## Application



- Modular I/O system with degree of protection IP20, particularly suitable for user-specific and complex automation tasks
- Can be expanded with S7-300 automation system signal, communication and function modules
- Applicable Ex analog input or output modules with HART optimize the ET 200M for use in process engineering
- Can be used in redundant systems (S7-400H, S7-400F/FH)
- Consists of a PROFIBUS DP IM 153 connection, up to eight or twelve I/O modules of the S7-300 automation system (assembly with bus connections or active bus modules) and if required a power supply
- Modules can be replaced during operation (hot swapping) with the bus modules active
- Can be supplied with integrated fiber optic interface if required
- Transmission rates up to 12 Mbit/s
- Ex approval to Cat. 3 for Zone 2 acc. to ATEX100 a
- Fail-safe digital in/outputs as well as analog inputs for safety-oriented signal processing in accordance with PROFIsafe
- Support of modules with expanded user data, e.g. HART modules with HART minor variables

## Technical specifications

### General technical data ET 200M

|                                                                                                                                                                                |                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Connection system                                                                                                                                                              | Screw connection, spring-loaded connection and FastConnect with permanent wiring                             |
| Degree of protection                                                                                                                                                           | IP20                                                                                                         |
| Ambient temperature on vertical wall (preferred mounting position) <ul style="list-style-type: none"> <li>• with horizontal assembly</li> <li>• with other assembly</li> </ul> | 0 ... +60 °C<br>0 ... +40 °C                                                                                 |
| Relative humidity                                                                                                                                                              | 5 ... 95% (RH stress level 2 according to IEC 1131-2)                                                        |
| Air pressure                                                                                                                                                                   | 795 ... 1080 hPa                                                                                             |
| Mechanical stress <ul style="list-style-type: none"> <li>• Vibrations</li> </ul>                                                                                               | IEC 68, parts 2 - 6:<br>10 ... 57 Hz (constant amplitude 0.075 mm) 57 ... 150 Hz (constant acceleration 1 g) |
| <ul style="list-style-type: none"> <li>• Shock</li> </ul>                                                                                                                      | IEC 68, parts 2 - 27<br>half-sine, 15 g, 11 ms                                                               |



## SIMATIC ET 200 distributed I/O

## ET 200M

Interface modules  
IM 153-1/153-2

## Overview



The ET 200M system with various interface modules is available for the decentralized use of S7-300 I/O modules. Depending on the application purpose, the best suited IM in terms of costs and functions can be selected:

**IM 153-1 Standard**

The IM 153-1 is one reasonably priced version that is best suited for most applications in the manufacturing environment. It permits the use of up to 8 S7-300 I/O modules.

**IM 153-2 High Feature**

For higher requirements in manufacturing technology, such as the use of F-technology or the highest performance in conjunction with clock synchronization, the IM 153-2 High Feature is available. This IM is also designed for use with the PCS 7 in the field of manufacturing applications. This IM can be redundantly used and supports typical functions as they are required in the control field. These include, for example, clock synchronization or time stamping with an accuracy of up to 1ms.

## Technical specifications

|                                                         | 6ES7 153-1AA03-0XB0   | 6ES7 153-2BA02-0XB0   | 6ES7 153-2BA82-0XB0   |
|---------------------------------------------------------|-----------------------|-----------------------|-----------------------|
| <b>Power supply</b>                                     |                       |                       |                       |
| Input voltage                                           |                       |                       |                       |
| • rated value, 24 V DC                                  | Yes                   |                       |                       |
| • permissible range, lower limit (DC)                   | 20.4 V                |                       |                       |
| • permissible range, upper limit (DC)                   | 28.8 V                |                       |                       |
| Input current                                           |                       |                       |                       |
| • rated value at 24 V DC                                | 625 mA                | 650 mA                | 650 mA                |
| Output voltage                                          |                       |                       |                       |
| • rated value, 5 V DC                                   | Yes                   | Yes                   | Yes                   |
| Output current                                          |                       |                       |                       |
| • for backplane bus (5 V DC), max.                      | 1 A                   | 1.5 A                 | 1.5 A                 |
| <b>Supply voltages</b>                                  |                       |                       |                       |
| Rated value                                             |                       |                       |                       |
| • 24 V DC                                               |                       | Yes                   | Yes                   |
| • permissible range (ripple included), lower limit (DC) | 20.4 V                | 20.4 V                | 20.4 V                |
| • permissible range (ripple included), upper limit (DC) | 28.8 V                | 28.8 V                | 28.8 V                |
| External protection for supply cables (recommendation)  | not necessary         | 2.5 A                 | 2.5 A                 |
| Mains buffering                                         |                       |                       |                       |
| • Mains/voltage failure stored energy time              | 5 ms                  | 5 ms                  | 5 ms                  |
| <b>Current consumption</b>                              |                       |                       |                       |
| Current consumption, max.                               | 350 mA; At 24 V DC    | 600 mA                | 600 mA                |
| Inrush current, typ.                                    | 2.5 A                 | 3 A                   | 3 A                   |
| I <sup>2</sup> t                                        | 0.1 A <sup>2</sup> ·s | 0.1 A <sup>2</sup> ·s | 0.1 A <sup>2</sup> ·s |

## Technical specifications (continued)

|                                                                           | 6ES7 153-1AA03-0XB0                                    | 6ES7 153-2BA02-0XB0                                         | 6ES7 153-2BA82-0XB0                                         |
|---------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
| <b>Power losses</b>                                                       |                                                        |                                                             |                                                             |
| Power loss, typ.                                                          | 3 W                                                    | 5.5 W                                                       | 5.5 W                                                       |
| <b>Address area</b>                                                       |                                                        |                                                             |                                                             |
| Addressing volume                                                         |                                                        |                                                             |                                                             |
| • Outputs                                                                 | 128 byte                                               | 244 byte                                                    | 244 byte                                                    |
| • Inputs                                                                  | 128 byte                                               | 244 byte                                                    | 244 byte                                                    |
| <b>Hardware configuration</b>                                             |                                                        |                                                             |                                                             |
| Number of modules per DP slave interface, max.                            | 8                                                      | 12                                                          | 12                                                          |
| <b>Communication functions</b>                                            |                                                        |                                                             |                                                             |
| Bus protocol/transmission protocol                                        | PROFIBUS DP to EN 50170                                | PROFIBUS DP to EN 50170                                     | PROFIBUS DP to EN 50170                                     |
| <b>Interfaces</b>                                                         |                                                        |                                                             |                                                             |
| PROFIBUS DP, output current, max.                                         | 90 mA                                                  | 70 mA                                                       | 70 mA                                                       |
| Interface physics, RS 485                                                 | Yes                                                    | Yes                                                         | Yes                                                         |
| Interface physics, FOC                                                    | No                                                     | No                                                          | No                                                          |
| <b>Connection method</b>                                                  |                                                        |                                                             |                                                             |
| PROFIBUS DP                                                               | 9-pin sub D socket                                     | 9-pin sub D                                                 | 9-pin sub D                                                 |
| <b>PROFIBUS DP</b>                                                        |                                                        |                                                             |                                                             |
| Transmission procedure                                                    | RS 485                                                 | RS 485                                                      | RS 485                                                      |
| Transmission rate, max.                                                   | 12 Mbit/s                                              | 12 Mbit/s                                                   | 12 Mbit/s                                                   |
| Node addresses                                                            | 1 to 125 permitted                                     | 1 to 125 permitted                                          | 1 to 125 permitted                                          |
| Automatic detection of transmission speed                                 | Yes                                                    | Yes                                                         | Yes                                                         |
| SYNC capability                                                           | Yes                                                    | Yes                                                         | Yes                                                         |
| FREECE capability                                                         | Yes                                                    | Yes                                                         | Yes                                                         |
| Direct data exchange (slave-to-slave communication)                       | Yes; Sender                                            | Yes; Sender                                                 | Yes; Sender                                                 |
| <b>1st interface</b>                                                      |                                                        |                                                             |                                                             |
| DP slave                                                                  |                                                        |                                                             |                                                             |
| • GSD file                                                                | (for DPV1) SIEM801D.GSD;<br>SI01801D.GSG               | SI04801.GSG                                                 | SI0480E.GSG                                                 |
| • Automatic baud rate search                                              | Yes                                                    | Yes                                                         | Yes                                                         |
| <b>Programming</b>                                                        |                                                        |                                                             |                                                             |
| Configuration software                                                    |                                                        |                                                             |                                                             |
| • STEP 7                                                                  | STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file | Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file | Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file |
| <b>Time stamping</b>                                                      |                                                        |                                                             |                                                             |
| Accuracy                                                                  |                                                        | 1 ms; 1ms at up to 8 modules;<br>10ms at up to 12 modules   | 1 ms; 1ms at up to 8 modules;<br>10ms at up to 12 modules   |
| Number of message buffers                                                 |                                                        | 15                                                          | 15                                                          |
| Messages per message buffer                                               |                                                        | 20                                                          | 20                                                          |
| Number of stampable digital inputs, max.                                  |                                                        | 128; Max. 128 signals/station; max. 32 signals/slot         | 128; Max. 128 signals/station; max. 32 signals/slot         |
| Time format                                                               |                                                        | RFC 1119                                                    | RFC 1119                                                    |
| Time resolution                                                           |                                                        | 0.466 ns                                                    | 0.466 ns                                                    |
| Time interval for transmitting the message buffer if a message is present |                                                        | 1 000 ms                                                    | 1 000 ms                                                    |
| Time stamp on signal change                                               |                                                        | rising / falling edge as signal entering or exiting         | rising / falling edge as signal entering or exiting         |

## SIMATIC ET 200 distributed I/O

## ET 200M

Interface modules  
IM 153-1/153-2

## Technical specifications (continued)

|                                            | 6ES7 153-1AA03-0XB0     | 6ES7 153-2BA02-0XB0     | 6ES7 153-2BA82-0XB0     |
|--------------------------------------------|-------------------------|-------------------------|-------------------------|
| <b>Isolation</b>                           |                         |                         |                         |
| Isolation checked with                     | Isolation voltage 500 V | Isolation voltage 500 V | Isolation voltage 500 V |
| <b>Environmental requirements</b>          |                         |                         |                         |
| Operating temperature                      |                         |                         |                         |
| • Min.                                     | 0 °C                    | 0 °C                    | -25 °C                  |
| • max.                                     | 60 °C                   | 60 °C                   | 60 °C                   |
| Air pressure                               |                         |                         |                         |
| • Operating altitude above sea level, max. | 3 000 m                 | 3 000 m                 | 3 000 m                 |
| <b>Degree of protection</b>                |                         |                         |                         |
| IP20                                       | Yes                     | Yes                     | Yes                     |
| <b>General information</b>                 |                         |                         |                         |
| Vendor identification (VendorID)           | 801Dh                   | 801Eh                   | 801Eh                   |
| <b>Dimensions and weight</b>               |                         |                         |                         |
| Dimensions                                 |                         |                         |                         |
| • Width                                    | 40 mm                   | 40 mm                   | 40 mm                   |
| • Height                                   | 125 mm                  | 125 mm                  | 125 mm                  |
| • Depth                                    | 117 mm                  | 117 mm                  | 117 mm                  |
| Weight                                     |                         |                         |                         |
| • Weight, approx.                          | 360 g                   | 360 g                   | 360 g                   |

|                              | 6ES7 195-7HD10-0XA0 |
|------------------------------|---------------------|
| <b>Accessories</b>           |                     |
| belongs to product           | ET 200M             |
| <b>Dimensions and weight</b> |                     |
| Dimensions                   |                     |
| • Width                      | 97 mm               |
| • Height                     | 92 mm               |
| • Depth                      | 30 mm               |
| Weight                       |                     |
| • Weight, approx.            | 133 g               |

|                              | 6ES7 195-7HA00-0XA0 | 6ES7 195-7HB00-0XA0 | 6ES7 195-7HC00-0XA0 |
|------------------------------|---------------------|---------------------|---------------------|
| <b>Dimensions and weight</b> |                     |                     |                     |
| Dimensions                   |                     |                     |                     |
| • Width                      | 97 mm               | 97 mm               | 97 mm               |
| • Height                     | 92 mm               | 92 mm               | 92 mm               |
| • Depth                      | 30 mm               | 30 mm               | 30 mm               |
| Weight                       |                     |                     |                     |
| • Weight, approx.            | 111 g               | 140 g               | 127 g               |

| Ordering data                                                                                                                                                                                                                                                                                                        | Order No.                                                                              | Order No.                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IM 153-1 interface module</b><br>Slave interface for connecting an ET 200M to PROFIBUS DP<br>• Standard temperature range                                                                                                                                                                                         | <b>6ES7 153-1AA03-0XB0</b>                                                             | <b>Accessories</b><br><b>PROFIBUS bus connector</b><br>90° outgoing cable, terminating resistor with disconnecting function, up to 12 Mbit/s, FastConnect<br>Without PG interface<br>• 1 unit<br>• 100 units<br>With PG interface<br>• 1 unit<br>• 100 units                                                           |
| <b>IM 153-2 interface module</b><br>Slave interface for connecting an ET 200M to PROFIBUS DP; also for use in redundant systems<br>• High Feature<br>• High Feature with extended temperature range                                                                                                                  | <b>6ES7 153-2BA02-0XB0</b><br><b>6ES7 153-2BA82-0XB0</b>                               | <b>6ES7 972-0BA52-0XA0</b><br><b>6ES7 972-0BA52-0XB0</b><br><b>6ES7 972-0BB52-0XA0</b><br><b>6ES7 972-0BB52-0XB0</b>                                                                                                                                                                                                   |
| <b>Active IM 153 /IM 153 bus module</b><br>For two IM 153-2 High Feature modules for designing redundant systems                                                                                                                                                                                                     | <b>6ES7 195-7HD10-0XA0</b>                                                             | <b>SIMATIC DP DIN rail for ET 200M</b><br>Accommodates up to 5 bus modules; for hot-swapping function<br>• Length: 483 mm (19")<br>• Length: 530 mm<br>• Length: 620 mm<br>• Length: 2000 mm                                                                                                                           |
| <b>Bus module for ET 200M</b><br>• To accommodate a power supply and an IM 153 module for the hot-swapping function during RUN time, incl. bus module cover<br>• To accommodate two 40-mm wide I/O modules for the hot-swapping function<br>• To accommodate one 80-mm wide I/O module for the hot-swapping function | <b>6ES7 195-7HA00-0XA0</b><br><b>6ES7 195-7HB00-0XA0</b><br><b>6ES7 195-7HC00-0XA0</b> | <b>SIMATIC S7-300 DIN rail</b><br>• Length: 160 mm<br>• Length: 480 mm (19")<br>• Length: 530 mm<br>• Length: 830 mm<br>• Length: 2000 mm                                                                                                                                                                              |
| <b>ET 200M redundancy bundle</b><br>Comprising two IM 153-2 High Feature modules and one IM 153/IM 153 bus module                                                                                                                                                                                                    | <b>6ES7153-2AR03-0XA0</b>                                                              | <b>S7 Manual Collection</b> J <b>6ES7 998-8XC01-8YE0</b><br>Electronic manuals on DVD, multi-language:<br>S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication) |
|                                                                                                                                                                                                                                                                                                                      |                                                                                        | <b>S7 Manual Collection, update service for 1 year</b> D <b>6ES7 998-8XC01-8YE2</b><br>Scope of delivery:<br>Current DVD "S7 Manual Collection" and the three subsequent updates                                                                                                                                       |

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

## SIMATIC ET 200 distributed I/O

## ET 200M

Interface modules  
IM 153-4 PN

## Overview



- To connect ET 200M to PROFINET IO (via copper line, RJ45) as an IO device
- 2 versions:
  - IM 153-4 PN STANDARD
  - IM 153-4 PN HIGH FEATURE: supports, in contrast to the STANDARD version, the operation of PROFIsafe F and HART modules
- Integrated 2-port switch
- 12 modules per station
- Usable I/O capacity: 192 byte each
- Active bus backplane to hot-swap modules available as an option
- Baud rate 10 Mbit/s / 100 Mbit/s (autonegotiation / full duplex)
- I&M functions in accordance with PROFIBUS International guideline order no. 3.502, Version V1.1

## Note:

Micro Memory Card with at least 64 KB required if not all the stations in the network support LLDP (Link Layer Discovery Protocol; proximity detection).

## Technical specifications

|                                                         | 6ES7 153-4AA01-0XB0                                                                                                              | 6ES7 153-4BA00-0XB0                                                                                                              |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Power supply</b>                                     |                                                                                                                                  |                                                                                                                                  |
| Output voltage                                          |                                                                                                                                  |                                                                                                                                  |
| • Rated value, 5 V DC                                   | Yes                                                                                                                              | Yes                                                                                                                              |
| Output current                                          |                                                                                                                                  |                                                                                                                                  |
| • for backplane bus (5 V DC), max.                      | 1.5 A                                                                                                                            | 1.5 A                                                                                                                            |
| <b>Supply voltages</b>                                  |                                                                                                                                  |                                                                                                                                  |
| Rated value                                             |                                                                                                                                  |                                                                                                                                  |
| • 24 V DC                                               | Yes                                                                                                                              | Yes                                                                                                                              |
| • permissible range (ripple included), lower limit (DC) | 20.4 V                                                                                                                           | 18.5 V                                                                                                                           |
| • permissible range (ripple included), upper limit (DC) | 28.8 V                                                                                                                           | 30.2 V                                                                                                                           |
| External protection for supply cables (recommendation)  | In a construction with grounded reference potential, a fuse is necessary for redundant interface modules (Recommendation: 2.5 A) | In a construction with grounded reference potential, a fuse is necessary for redundant interface modules (Recommendation: 2.5 A) |
| Mains buffering                                         |                                                                                                                                  |                                                                                                                                  |
| • Mains/voltage failure stored energy time              | 5 ms                                                                                                                             | 5 ms                                                                                                                             |
| <b>Current consumption</b>                              |                                                                                                                                  |                                                                                                                                  |
| Current consumption, max.                               | 600 mA                                                                                                                           | 600 mA                                                                                                                           |
| Inrush current, typ.                                    | 4 A                                                                                                                              | 4 A                                                                                                                              |
| $I^2t$                                                  | 0.09 A <sup>2</sup> ·s                                                                                                           | 0.09 A <sup>2</sup> ·s                                                                                                           |
| <b>Power losses</b>                                     |                                                                                                                                  |                                                                                                                                  |
| Power loss, typ.                                        | 6 W; typical                                                                                                                     | 6 W; typical                                                                                                                     |
| <b>Address area</b>                                     |                                                                                                                                  |                                                                                                                                  |
| Addressing volume                                       |                                                                                                                                  |                                                                                                                                  |
| • Outputs                                               | 192 byte                                                                                                                         | 192 byte                                                                                                                         |
| • Inputs                                                | 192 byte                                                                                                                         | 672 byte; extended HART user data                                                                                                |
| <b>Hardware configuration</b>                           |                                                                                                                                  |                                                                                                                                  |
| Number of modules per DP slave interface, max.          | 12                                                                                                                               | 12                                                                                                                               |
| <b>Communication functions</b>                          |                                                                                                                                  |                                                                                                                                  |
| Bus protocol/transmission protocol                      | PN IO                                                                                                                            | PN IO                                                                                                                            |
| <b>Alarms/diagnostics/status information</b>            |                                                                                                                                  |                                                                                                                                  |
| Diagnostic indication LED                               |                                                                                                                                  |                                                                                                                                  |
| • Connection to network LINK (green)                    | Yes                                                                                                                              | Yes                                                                                                                              |
| • Transmit/receive RX/TX (yellow)                       | Yes                                                                                                                              | Yes                                                                                                                              |
| <b>Isolation</b>                                        |                                                                                                                                  |                                                                                                                                  |
| Isolation checked with                                  | 500 V DC                                                                                                                         | Between Profinet and 24 V supply: 1500 V AC<br>Between functional grounding and 24 V supply: 500 V DC                            |

## Technical specifications (continued)

|                                            | 6ES7 153-4AA01-0XB0 | 6ES7 153-4BA00-0XB0 |
|--------------------------------------------|---------------------|---------------------|
| <b>Environmental requirements</b>          |                     |                     |
| Operating temperature                      |                     |                     |
| • Min.                                     | 0 °C                | 0 °C                |
| • Max.                                     | 60 °C               | 60 °C               |
| Air pressure                               |                     |                     |
| • Operating altitude above sea level, max. | 2 000 m             | 2 000 m             |
| <b>Degree of protection</b>                |                     |                     |
| IP20                                       | Yes                 | Yes                 |
| <b>General information</b>                 |                     |                     |
| Vendor identification (VendorID)           | 002AH               | 002AH               |
| Device identifier (DeviceID)               | 0302H               | 0302H               |
| <b>Dimensions and weight</b>               |                     |                     |
| Dimensions                                 |                     |                     |
| • Width                                    | 40 mm               | 40 mm               |
| • Height                                   | 125 mm              | 125 mm              |
| • Depth                                    | 118 mm              | 118 mm              |
| Weight                                     |                     |                     |
| • Weight, approx.                          | 215 g; approx.      | 215 g               |

## Ordering data

## Order No.

## IM 153-4 PN interface module

I/O device to connect an ET 200M to PROFINET

Standard

6ES7 153-4AA01-0XB0

High Feature

6ES7 153-4BA00-0XB0

## Accessories

## Bus modules for ET 200M

- To accommodate a power supply and an IM 153 for the hot-swapping function during RUN, incl. bus module cover
- To accommodate two 40-mm wide I/O modules for the hot-swapping function
- To accommodate one 80-mm wide I/O module for the hot-swapping function

6ES7 195-7HA00-0XA0

6ES7 195-7HB00-0XA0

6ES7 195-7HC00-0XA0

## SIMATIC Micro Memory Card

64 KB<sup>1)</sup>

6ES7 953-8LF20-0AA0

## SIMATIC DP DIN rail for ET 200M

Accommodates up to 5 bus modules; for hot-swapping function

- Length: 483 mm (19")
- Length: 530 mm
- Length: 620 mm
- Length: 2000 mm

6ES7 195-1GA00-0XA0

6ES7 195-1GF30-0XA0

6ES7 195-1GG30-0XA0

6ES7 195-1GC00-0XA0

## SIMATIC S7-300 DIN rail

Length: 160 mm

6ES7 390-1AB60-0AA0

Length: 480 mm (19")

6ES7 390-1AE80-0AA0

Length: 530 mm

6ES7 390-1AF30-0AA0

Length: 830 mm

6ES7 390-1AJ30-0AA0

Length: 2000 mm

6ES7 390-1BC00-0AA0

## S7 Manual Collection

Electronic manuals on DVD, multi-language:  
S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)

## Order No.

6ES7 998-8XC01-8YE0

## S7 Manual Collection update service for 1 year

Scope of delivery:  
Current DVD "S7 Manual Collection" and the three subsequent updates

6ES7 998-8XC01-8YE2

## Industrial Ethernet FC RJ45 Plug 180

RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

1 unit

6GK1 901-1BB10-2AA0

10 units

6GK1 901-1BB10-2AB0

50 units

6GK1 901-1BB10-2AE0

## Industrial Ethernet Fast Connect installation cables

- Fast Connect standard cable
- Fast Connect trailing cable
- Fast Connect marine cable

6XV1 840-2AH10

6XV1 840-3AH10

6XV1 840-4AH10

## Industrial Ethernet Fast Connect

Stripping Tool

6GK1 901-1GA00

<sup>1)</sup> To operate the IM153-4, an MMC is required with at least 64 KB memory. Cards with higher memory capacity may also be used.

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

# SIMATIC ET 200 distributed I/O

## ET 200M

### SIPLUS interface modules SIPLUS IM 153-1/153-2

#### Overview



#### Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

|                                                                                                                             | SIPLUS IM 153-1                                                                       | SIPLUS IM 153-2            | SIPLUS IM 153-2                              |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------|----------------------------------------------|
| <b>Order number</b>                                                                                                         | <b>6AG1 153-1AA03-2XB0</b>                                                            | <b>6AG1 153-2BA02-7XY0</b> | <b>6AG1 153-2BA02-7XB0</b>                   |
| <b>Order No. based on</b>                                                                                                   | <b>6ES7 153-1AA03-0XB0</b>                                                            | <b>6ES7 153-2BA02-0XB0</b> | <b>6ES7 153-2BA02-0XB0</b>                   |
| Ambient temperature range                                                                                                   | -40 ... +70 °C<br>Startup temperature -25 °C                                          | -25 ... +60 °C             | -40 ... +70 °C<br>Startup temperature -25 °C |
| Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1). | No                                                                                    | Yes                        | No                                           |
| Conformal coating                                                                                                           | Coating of the printed circuit boards and the electronic components                   |                            |                                              |
| Technical data                                                                                                              | The technical data of the standard product applies except for the ambient conditions. |                            |                                              |

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| SIPLUS bus module                                                                                                           | for accommodating a PS and an IM 153                                                  | for accommodating two 40 mm wide I/O modules |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Order number</b>                                                                                                         | <b>6AG1 195-7HA00-2XA0</b>                                                            | <b>6AG1 195-7HB00-7XA0</b>                   |
| <b>Order No. based on</b>                                                                                                   | <b>6ES7 195-7HA00-0XA0</b>                                                            | <b>6ES7 195-7HB00-0XA0</b>                   |
| Ambient temperature range                                                                                                   | -25 ... +70 °C                                                                        | -25 ... +70 °C                               |
| Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1). | No                                                                                    | Yes                                          |
| Conformal coating                                                                                                           | Coating of the printed circuit boards and the electronic components                   |                                              |
| Technical data                                                                                                              | The technical data of the standard product applies except for the ambient conditions. |                                              |

| SIPLUS bus module                                                                                                           | for accommodating an 80 mm module                                                     | for accommodating 2 IM 153-2 |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------|
| <b>Order number</b>                                                                                                         | <b>6AG1 195-7HC00-2XA0</b>                                                            | <b>6AG1 195-7HD10-2XA0</b>   |
| <b>Order No. based on</b>                                                                                                   | <b>6ES7 195-7HC00-0XA0</b>                                                            | <b>6ES7 195-7HD10-0XA0</b>   |
| Ambient temperature range                                                                                                   | -25 ... +70 °C                                                                        | -25 ... +70 °C               |
| Compliant with the standards for electronic equipment used on railway rolling stock (EN 50155, temperature T1, category 1). | No                                                                                    | Yes                          |
| Conformal coating                                                                                                           | Coating of the printed circuit boards and the electronic components                   |                              |
| Technical data                                                                                                              | The technical data of the standard product applies except for the ambient conditions. |                              |

**Overview (continued)****Ambient conditions**

|                                                                                    |                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relative humidity                                                                  | 5 ... 100 %<br>Condensation permissible                                                                                                                                                                |
| Biologically active substances                                                     | Conformity with EN 60721-3-3,<br>Class 3B2 mold and fungal<br>spores (except fauna)                                                                                                                    |
| Chemically active substances                                                       | Conformity with EN 60721-3-3,<br>Class 3C4 incl. salt mist and<br>ISA-S71.04 severity level G1; G2;<br>G3; GX <sup>1) 2)</sup>                                                                         |
| Mechanically active substances                                                     | Conformity with EN 60721-3-3,<br>Class 3S4 including conductive<br>sand, dust <sup>2)</sup>                                                                                                            |
| Air pressure (depending on the<br>highest positive temperature range<br>specified) | 1080 ... 795 hPa<br>(-1000 ... +2000 m)<br>see ambient temperature range<br><br>795 ... 658 hPa<br>(+2000 ... +3500 m)<br>derating 10 K<br><br>658 ... 540 hPa<br>(+3500 ... +5000 m)<br>derating 20 K |

<sup>1)</sup> ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm;  
H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm;  
NH<sub>3</sub> < 49 ppm; O<sub>3</sub> < 0.1 ppm; NOX < 5.2 ppm  
Limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm;  
Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH<sub>3</sub> < 247 ppm;  
O<sub>3</sub> < 1.0 ppm; NOX < 10.4 ppm

<sup>2)</sup> The supplied plug covers must remain in place over the unused  
interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

**Ordering data****Order No.****IM 153-1 interface module**

Slave interface for connecting an  
ET 200M to PROFIBUS DP

- Standard temperature range L **6AG1 153-1AA03-2XB0**

**IM 153-2 interface module**

Slave interface for connecting an  
ET 200M to PROFIBUS DP; also  
for use in redundant systems

- High Feature H **6AG1 153-2BA02-7XB0**

**Active IM 153/IM 153 bus  
module**

For two IM 153-2 High Feature  
modules for designing redundant  
systems

**6AG1 195-7HD10-2XA0**

**Bus module for ET 200M**

- To accommodate a power  
supply and an IM 153 for the hot-  
swapping function during RUN,  
incl. bus module cover
- To accommodate two 40 mm  
wide I/O modules for the hot-  
swapping function
- To accommodate one 80 mm  
wide I/O module for the hot  
swapping function

**6AG1 195-7HA00-2XA0**

**6AG1 195-7HB00-7XA0**

**6AG1 195-7HC00-2XA0**

**Accessories**

See SIMATIC ET 200M  
IM 153-1/153-2, page 9/187

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

L: Subject to export regulations AL: 91999 and ECCN: N



# SIMATIC ET 200 distributed I/O

## ET 200M

### SIPLUS interface modules

#### SIPLUS IM 153-4 PN IO

#### Overview



- For connection of ET 200M as IO device to PROFINET IO (copper, RJ-45)
- 2 versions:
  - IM 153-4 PN STANDARD
  - IM 153-4 PN HIGH FEATURE: additionally to the STANDARD version, operation of PROFI-safe F and HART modules
- Integrated 2-port switch
- 12 modules per station
- Usable I/O quantity structure: 192 byte each
- Active backplane bus for hot swapping of modules optionally available
- Baud rate 10 Mbit/s / 100 Mbit/s (Autonegotiation/Full Duplex)
- I&M functions according to PNO-Guideline Order-No. 3.502, Version V1.1

#### Notes:

Micro Memory Card with min. 64 KB required if not all participants in the network support LLDP (Link Layer Discovery Protocol; neighbor detection).

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

| SIPLUS ET 200 M IM 153-4 PN |                                                                                       |
|-----------------------------|---------------------------------------------------------------------------------------|
| <b>Order number</b>         | <b>6AG1 153-4AA01-7XB0</b>                                                            |
| <b>Order No. based on</b>   | <b>6ES7 153-4AA01-0XB0</b>                                                            |
| Ambient temperature range   | -25 °C ... + 70 °C                                                                    |
| Conformal coating           | Coating of the printed circuit boards and the electronic components                   |
| Technical data              | The technical data of the standard product applies except for the ambient conditions. |

#### Ambient conditions

|                                                                              |                                                                                                                                                                                            |
|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relative humidity                                                            | 5 ... 100 %<br>Condensation permissible                                                                                                                                                    |
| Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                              |
| Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                                      |
| Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                                      |
| Air pressure (depending on the highest positive temperature range specified) | 1080 ... 795 hPa<br>(-1000 ... +2000 m)<br>See ambient temperature range<br>795 ... 658 hPa<br>(+2000 ... +3500 m)<br>derating 10 K658 ... 540 hPa<br>(+3500 ... +5000 m)<br>derating 20 K |

- <sup>1)</sup> ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm; H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH<sub>3</sub> < 49 ppm; O<sub>3</sub> < 0.1 ppm; NOX < 5.2 ppm  
Limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH<sub>3</sub> < 247 ppm; O<sub>3</sub> < 1.0 ppm; NOX < 10.4 ppm

- <sup>2)</sup> The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:  
[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

| Ordering data                                             | Order No.                                                    |
|-----------------------------------------------------------|--------------------------------------------------------------|
| <b>SIPLUS ET 200 M interface connection IM 153-4 PN</b>   | <b>6AG1 153-4AA01-7XB0</b>                                   |
| (extended temperature range and medial exposure)          |                                                              |
| IO device to connect an ET 200M to PROFINET <sup>1)</sup> |                                                              |
| <b>Accessories</b>                                        | See SIMATIC ET 200M interface module IM 153-4 PN, page 9/189 |

- <sup>1)</sup> To operate the IM153-4, an MMC is required with at least 64 KB memory. Cards with higher memory capacity may also be used.

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

**Overview digital modules**

- Digital inputs/outputs
- For flexible adaptation of the controller to the respective task
- For connecting digital sensors and actuators

For further information see SIMATIC S7-300, Chapter 5.

**Overview analog modules**

- Analog inputs and outputs
- For solving even more complex tasks with analog process signals
- For connecting analog actuators and sensors without additional amplifiers

For further information see SIMATIC S7-300, Chapter 5.

## SIMATIC ET 200 distributed I/O

## ET 200M

## I/O modules

## Analog input module with HART

## Overview



- Can only be plugged into ET 200M with IM 153-2 and IM 153-2 FO
- 8 AI HART
- Redundancy switching
- Firmware update
- HART minor variables

## Technical specifications

| 6ES7 331-7TF01-0AB0                                                     |                                         |
|-------------------------------------------------------------------------|-----------------------------------------|
| <b>Supply voltages</b>                                                  |                                         |
| Load voltage L+                                                         |                                         |
| • Rated value (DC)                                                      | 24 V                                    |
| • Reverse polarity protection                                           | Yes                                     |
| <b>Current consumption</b>                                              |                                         |
| from load voltage L+ (without load), max.                               | 20 mA                                   |
| from backplane bus 5 V DC, max.                                         | 120 mA                                  |
| <b>Current consumption/ power loss</b>                                  |                                         |
| Power loss, typ.                                                        | 1.5 W                                   |
| <b>Connection method</b>                                                |                                         |
| Required front connector                                                | 20-pin                                  |
| <b>Isochronous mode</b>                                                 |                                         |
| Isochronous mode                                                        | No                                      |
| <b>Analog inputs</b>                                                    |                                         |
| Number of analog inputs                                                 | 8                                       |
| Cable length, shielded, max.                                            | 800 m                                   |
| Input ranges (rated values), currents                                   |                                         |
| • 0 to 20 mA                                                            | Yes                                     |
| Current input                                                           |                                         |
| • permissible input current for current input (destruction limit), max. | 40 mA                                   |
| <b>Analog value creation</b>                                            |                                         |
| Measurement principle                                                   | Sigma Delta                             |
| Integrations and conversion time/ resolution per channel                |                                         |
| • Resolution with overrange (bit including sign), max.                  | 16 bit                                  |
| • Integration time, parameterizable                                     | Yes                                     |
| • Integration time, ms                                                  | 20 ms@50 Hz/16.6 ms@60 Hz/100 ms@100 Hz |
| • Basic conversion time, including integration time, ms                 | 65ms@50Hz / 55ms@60Hz / 305ms@100Hz     |
| • Interference voltage suppression for interference frequency f1 in Hz  | 60 / 50 / 10 Hz                         |

| 6ES7 331-7TF01-0AB0                            |            |
|------------------------------------------------|------------|
| <b>Encoder</b>                                 |            |
| Connection of signal encoders                  |            |
| • for current measurement as 2-wire transducer | Yes        |
| • for current measurement as 4-wire transducer | Yes        |
| <b>Errors/accuracies</b>                       |            |
| Operational limit in overall temperature range |            |
| • Current, relative to input area              | +/- 0.15 % |
| Basic error limit (operational limit at 25 °C) |            |
| • Current, relative to input area              | +/- 0.1 %  |
| <b>Alarms/diagnostics/status information</b>   |            |
| Alarms                                         |            |
| • Diagnostic alarm                             | Yes        |
| • Limit value alarm                            | Yes        |
| Diagnostics                                    |            |
| • Diagnostic information readable              | Yes        |
| <b>Isolation</b>                               |            |
| Isolation checked with                         | 500        |
| <b>Galvanic isolation</b>                      |            |
| Galvanic isolation analog inputs               |            |
| • between the channels                         | No         |
| • between the channels, in groups of           | 8          |
| • between the channels and the backplane bus   | Yes        |
| <b>Dimensions and weight</b>                   |            |
| Dimensions and weight                          |            |
| • Width                                        | 40 mm      |
| • Height                                       | 125 mm     |
| • Depth                                        | 117 mm     |
| Weight                                         |            |
| • Weight, approx.                              | 205 g      |

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                        | Order No.                                                                                                                                                  |                                                                                                                                                                                    | Order No.                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>SM 331 HART analog input module</b><br><br>8 inputs, 0/4 ... 20 mA, HART for ET 200M with IM 153-2 interface module                                                                                                                                                                                                                                                                               | <b>6ES7 331-7TF01-0AB0</b>                                                                                                                                 | <b>Label cover</b><br><br>(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM                                                     | <b>6ES7 392-2XY00-0AA0</b>                                                                                           |
| <b>Accessories</b>                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                            | <b>Labeling strips</b><br><br>(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM                                                 | <b>6ES7 392-2XX00-0AA0</b>                                                                                           |
| <b>Front connectors</b> <ul style="list-style-type: none"><li>• 20-pin, with screw-type contacts<ul style="list-style-type: none"><li>- 1 unit</li><li>- 100 units</li></ul></li><li>• 20-pin, with spring contacts<ul style="list-style-type: none"><li>- 1 unit</li><li>- 100 units</li></ul></li><li>• 20-pin, with FastConnect<ul style="list-style-type: none"><li>- 1 unit</li></ul></li></ul> | <b>6ES7 392-1AJ00-0AA0</b><br><b>6ES7 392-1AJ00-1AB0</b><br><br><b>6ES7 392-1BJ00-0AA0</b><br><b>6ES7 392-1BJ00-1AB0</b><br><br><b>6ES7 392-1CJ00-0AA0</b> | <b>S7-SmartLabel V3.0</b><br><br>Software for machine labeling of modules directly from the STEP 7 project<br><br>Single license J<br>Upgrade single license J                     | <b>2XV9 450-1SL03-0YX0</b><br><br><b>2XV9 450-1SL03-0YX4</b>                                                         |
| <b>LK 393 cable guide</b><br><br>Mandatory for operation in hazardous areas                                                                                                                                                                                                                                                                                                                          | <b>6ES7 393-4AA00-0AA0</b>                                                                                                                                 | <b>Labeling sheets for machine printing</b><br><br>For 16-channel signal modules, DIN A4, for printing with laser printers; 10 units<br><br>petrol<br>light beige<br>yellow<br>red | <b>6ES7 392-2AX00-0AA0</b><br><b>6ES7 392-2BX00-0AA0</b><br><b>6ES7 392-2CX00-0AA0</b><br><b>6ES7 392-2DX00-0AA0</b> |
| <b>SIMATIC DP DIN rail for ET 200M</b><br><br>For insertion of up to 5 bus modules for <ul style="list-style-type: none"><li>• Length: 483 mm (19")</li><li>• Length: 530 mm</li></ul>                                                                                                                                                                                                               | <b>6ES7 195-1GA00-0XA0</b><br><b>6ES7 195-1GF30-0XA0</b>                                                                                                   |                                                                                                                                                                                    |                                                                                                                      |
| <b>SIMATIC S7-300 DIN rail</b> <ul style="list-style-type: none"><li>• Length: 160 mm</li><li>• Length: 480 mm (19")</li><li>• Length: 530 mm</li><li>• Length: 830 mm</li><li>• Length: 2000 mm</li></ul>                                                                                                                                                                                           | <b>6ES7 390-1AB60-0AA0</b><br><b>6ES7 390-1AE80-0AA0</b><br><b>6ES7 390-1AF30-0AA0</b><br><b>6ES7 390-1AJ30-0AA0</b><br><b>6ES7 390-1BC00-0AA0</b>         |                                                                                                                                                                                    |                                                                                                                      |

J: Subject to export regulations AL: N and ECCN: EAR99S

## SIMATIC ET 200 distributed I/O

## ET 200M

## I/O modules

## Analog output module with HART

## Overview



- For plugging into ET 200M exclusively with IM 153-2 and IM 153-2 FO
- 8 AO HART
- Redundancy switching
- Firmware update
- HART minor variables

## Technical specifications

| 6ES7 332-8TF01-0AB0                                     |        |
|---------------------------------------------------------|--------|
| <b>Supply voltages</b>                                  |        |
| Load voltage L+                                         |        |
| • Rated value (DC)                                      | 24 V   |
| <b>Current consumption</b>                              |        |
| from load voltage L+ (without load), max.               | 350 mA |
| from backplane bus 5 V DC, max.                         | 110 mA |
| <b>Power losses</b>                                     |        |
| Power loss, typ.                                        | 6 W    |
| <b>Connection method</b>                                |        |
| Required front connector                                | 20-pin |
| <b>Analog outputs</b>                                   |        |
| Number of analog outputs                                | 8      |
| Cable length, shielded, max.                            | 800 m  |
| Current output, no-load voltage, max.                   | 24 V   |
| Output ranges, current                                  |        |
| • 0 to 20 mA                                            | Yes    |
| • -20 to +20 mA                                         | No     |
| • 4 to 20 mA                                            | Yes    |
| Load impedance (in rated range of output)               |        |
| • with current outputs, max.                            | 750 Ω  |
| • with current outputs, inductive load, max.            | 10 mH  |
| <b>Analog value creation</b>                            |        |
| Integrations and conversion time/resolution per channel |        |
| • Resolution with overrange (bit including sign), max.  | 16 bit |
| Settling time                                           |        |
| • for resistive load                                    | 0.1 ms |
| • for inductive load                                    | 0.5 ms |

| 6ES7 332-8TF01-0AB0                            |           |
|------------------------------------------------|-----------|
| <b>Errors/accuracies</b>                       |           |
| Operational limit in overall temperature range |           |
| • Current, relative to output area             | +/- 0.2 % |
| Basic error limit (operational limit at 25 °C) |           |
| • Current, relative to output area             | +/- 0.1 % |
| <b>Alarms/diagnostics/status information</b>   |           |
| Substitute values connectable                  | Yes       |
| Alarms                                         |           |
| • Diagnostic alarm                             | Yes       |
| Diagnostics                                    |           |
| • Diagnostic information readable              | Yes       |
| <b>Isolation</b>                               |           |
| Isolation checked with                         | 500 V DC  |
| <b>Galvanic isolation</b>                      |           |
| Galvanic isolation analog outputs              |           |
| • between the channels and the backplane bus   | Yes       |
| <b>Dimensions and weight</b>                   |           |
| Dimensions                                     |           |
| • Width                                        | 40 mm     |
| • Height                                       | 125 mm    |
| • Depth                                        | 117 mm    |
| Weight                                         |           |
| • Weight, approx.                              | 220 g     |

| Ordering data                                                                                                                            | Order No.                                                                                                                                          |                                                                                                                                                                                                                                                            | Order No.                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>SM 332 HART analog output module</b><br>HART analog output, 8 outputs, 0/4 ... 20 mA, HART for ET 200M with IM 153-2                  | <b>6ES7 332-8TF01-0AB0</b>                                                                                                                         | <b>S7 Manual Collection</b> J                                                                                                                                                                                                                              | <b>6ES7 998-8XC01-8YE0</b>                                                                                           |
| <b>Accessories</b>                                                                                                                       |                                                                                                                                                    | Electronic manuals on DVD, multi-language:<br>S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication) |                                                                                                                      |
| <b>Front connector</b> (1 unit)<br>20-pin, with screw contacts                                                                           | <b>6ES7 392-1AJ00-0AA0</b>                                                                                                                         | <b>S7 Manual Collection update service for 1 year</b> D                                                                                                                                                                                                    | <b>6ES7 998-8XC01-8YE2</b>                                                                                           |
| <b>LK 393 cable guide</b><br>Mandatory for operation in hazardous areas                                                                  | <b>6ES7 393-4AA00-0AA0</b>                                                                                                                         | Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates                                                                                                                                                                     |                                                                                                                      |
| <b>SIMATIC DP mounting rail for ET 200M</b><br>For mounting of up to 5 bus modules for<br>• Length: 483 mm<br>• Length: 530 mm           | <b>6ES7 195-1GA00-0XA0</b><br><b>6ES7 195-1GF30-0XA0</b>                                                                                           | <b>S7-SmartLabel V3.0</b><br>Software for machine labeling of modules directly from the STEP 7 project<br>Single License J<br>Upgrade Single License J                                                                                                     |                                                                                                                      |
| <b>SIMATIC S7-300 mounting rail</b><br>• Length: 160 mm<br>• Length: 480 mm<br>• Length: 530 mm<br>• Length: 830 mm<br>• Length: 2000 mm | <b>6ES7 390-1AB60-0AA0</b><br><b>6ES7 390-1AE80-0AA0</b><br><b>6ES7 390-1AF30-0AA0</b><br><b>6ES7 390-1AJ30-0AA0</b><br><b>6ES7 390-1BC00-0AA0</b> | <b>Labeling sheets for machine printing</b><br>For 16-channel signal modules, DIN A4, for printing with laser printers; 10 units<br>petrol<br>light beige<br>yellow<br>red                                                                                 | <b>2XV9 450-1SL03-0YX0</b><br><b>2XV9 450-1SL03-0YX4</b>                                                             |
| <b>Label cover</b><br>(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM               | <b>6ES7 392-2XY00-0AA0</b>                                                                                                                         |                                                                                                                                                                                                                                                            | <b>6ES7 392-2AX00-0AA0</b><br><b>6ES7 392-2BX00-0AA0</b><br><b>6ES7 392-2CX00-0AA0</b><br><b>6ES7 392-2DX00-0AA0</b> |
| <b>Labeling strips</b><br>(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM           | <b>6ES7 392-2XX00-0AA0</b>                                                                                                                         |                                                                                                                                                                                                                                                            |                                                                                                                      |

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

## SIMATIC ET 200 distributed I/O

## ET 200M

## I/O modules

## Ex analog input module with HART

## Overview



- For connecting HART devices in hazardous areas
- Can only be plugged into ET 200M
- 2 AI HART, Ex
- 2 inputs in 2 channel groups (single-channel isolation)
- Measurement type/range can be selected for each channel
- Diagnostics and diagnostic alarm parameterizable

## Technical specifications

| 6ES7 331-7TB00-0AB0                                                     |                                                                                      |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                                                  |                                                                                      |
| Load voltage L+                                                         |                                                                                      |
| • Rated value (DC)                                                      | 24 V                                                                                 |
| • Reverse polarity protection                                           | Yes                                                                                  |
| Power supply to the transmitters                                        |                                                                                      |
| • Present                                                               | Yes                                                                                  |
| • Rated value (DC)                                                      | 15 V; at 22 mA                                                                       |
| • Short-circuit proof                                                   | Yes; approx. 30 mA                                                                   |
| • No-load voltage (DC)                                                  | 29.6 V                                                                               |
| <b>Current consumption</b>                                              |                                                                                      |
| from backplane bus 5 V DC, max.                                         | 100 mA                                                                               |
| from supply voltage L+, max.                                            | 180 mA                                                                               |
| <b>Power losses</b>                                                     |                                                                                      |
| Power loss, typ.                                                        | 4.5 W                                                                                |
| <b>Analog inputs</b>                                                    |                                                                                      |
| Number of analog inputs                                                 | 2                                                                                    |
| Cable length, shielded, max.                                            | 400 m                                                                                |
| • Current                                                               | Yes                                                                                  |
| Input ranges (rated values), currents                                   |                                                                                      |
| • 0 to 20 mA                                                            | Yes                                                                                  |
| • Input resistance (0 to 20 mA)                                         | 50 Ω                                                                                 |
| • 4 to 20 mA                                                            | Yes                                                                                  |
| • Input resistance (4 to 20 mA)                                         | 50 Ω                                                                                 |
| Current input                                                           |                                                                                      |
| • Permissible input current for current input (destruction limit), max. | 40 mA                                                                                |
| <b>Analog value creation</b>                                            |                                                                                      |
| Measurement principle                                                   | Sigma Delta                                                                          |
| Integrations and conversion time/ resolution per channel                |                                                                                      |
| • Resolution with overrange (bit including sign), max.                  | 16 bit; 10 to 15 bit + sign                                                          |
| • Integration time, parameterizable                                     | Yes                                                                                  |
| • Integration time, ms                                                  | 2.5 / 16.67 / 20 / 100 ms                                                            |
| • Basic conversion time, including integration time, ms                 | 2.5 / 16.67 / 20 / 100 (1 channel enabled); 7.5 / 50 / 60 / 300 (2 channels enabled) |
| • Interference voltage suppression for interference frequency f1 in Hz  | 10 / 50 / 60 / 400 Hz                                                                |

| 6ES7 331-7TB00-0AB0                                                                                |                               |
|----------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Encoder</b>                                                                                     |                               |
| Connection of signal encoders                                                                      |                               |
| • for current measurement as 2-wire transducer                                                     | Yes                           |
| • for current measurement as 4-wire transducer                                                     | Yes                           |
| <b>Ex(i) characteristics</b>                                                                       |                               |
| Module for Ex(i) protection                                                                        | Yes                           |
| Max. values of input circuits (per channel)                                                        |                               |
| • Co (permissible external capacity), max.                                                         | 62 nF                         |
| • Io (short-circuit current), max.                                                                 | 96.1 mA                       |
| • Lo (permissible external inductivity), max.                                                      | 3 mH                          |
| • Po (power of load), max.                                                                         | 511 mW                        |
| • Uo (output no-load voltage), max.                                                                | 26 V                          |
| • Um (fault voltage), max.                                                                         | 250 V; DC                     |
| • Ta (permissible ambient temperature), max.                                                       | 0.6 °C                        |
| <b>Errors/accuracies</b>                                                                           |                               |
| Linearity error (relative to input area)                                                           | +/- 0.01 %                    |
| Temperature error (relative to input area)                                                         | +/- 0.01 %                    |
| Crosstalk between the inputs, min.                                                                 | 130 dB                        |
| Repeat accuracy in settled status at 25 °C (relative to input area)                                | +/- 0.05 %                    |
| Operational limit in overall temperature range                                                     |                               |
| • Current, relative to input area                                                                  | +/- 0.45 %; from 0/4 to 20 mA |
| Basic error limit (operational limit at 25 °C)                                                     |                               |
| • Current, relative to input area                                                                  | +/- 0.1 %; From 0/4 to 20 mA  |
| Interference voltage suppression for $f = n \times (f_l \pm 1\%)$ , $f_l$ = interference frequency |                               |
| • Series mode interference (peak value of interference < rated value of input range), min.         | 60 dB                         |
| • Common mode interference, min.                                                                   | 130 dB                        |

## Technical specifications (continued)

| 6ES7 331-7TB00-0AB0                                  |                                                                         |
|------------------------------------------------------|-------------------------------------------------------------------------|
| <b>Alarms/diagnostics/status information</b>         |                                                                         |
| Alarms                                               |                                                                         |
| • Diagnostic alarm                                   | Yes; parameterizable                                                    |
| • Limit value alarm                                  | Yes; parameterizable, channels 0 and 1                                  |
| Diagnostics                                          |                                                                         |
| • Diagnostic functions                               | Yes; can be set in parameters, red LED, alarm message                   |
| • Diagnostic information readable                    | Yes                                                                     |
| • Overrange                                          | Yes; red LED, signal                                                    |
| • Wire break in signal transmitter cable             | Yes; red LED, signal                                                    |
| • Short circuit of the signal encoder cable          | Yes; red LED, signal                                                    |
| • HART communication active                          | Yes; green LED (H)                                                      |
| Diagnostic indication LED                            |                                                                         |
| • Group error SF (red)                               | Yes                                                                     |
| • Channel error indicator F (red)                    | Yes                                                                     |
| <b>Isolation</b>                                     |                                                                         |
| tested with                                          |                                                                         |
| • Channels against backplane bus and load voltage L+ | 1500 V AC                                                               |
| • Channels among one another                         | 1500 V AC                                                               |
| • Load voltage L+ against backplane bus              | 500 V DC                                                                |
| <b>Galvanic isolation</b>                            |                                                                         |
| between the channels and backplane bus               | Yes                                                                     |
| Galvanic isolation analog inputs                     |                                                                         |
| • Galvanic isolation analog inputs                   | Yes                                                                     |
| Galvanic isolation analog outputs                    |                                                                         |
| • between the channels                               | Yes                                                                     |
| • between the channels and the load voltage L+       | Yes                                                                     |
| <b>Permissible potential difference</b>              |                                                                         |
| between the inputs (UCM)                             | 60 V DC / 30 V AC                                                       |
| <b>Environmental requirements</b>                    |                                                                         |
| Operating temperature                                |                                                                         |
| • max.                                               | 60 °C                                                                   |
| <b>Standards, approvals, certificates</b>            |                                                                         |
| FM approval                                          | Available soon                                                          |
| Type of protection acc. to EN 50020 (CENELEC)        | [EEx ib] IIC                                                            |
| Type of protection acc. to FM                        | Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4 |
| Test number KEMA                                     | KEMA 97; ATEX3039 X                                                     |
| Type of protection acc. to KEMA                      | II3 (2) G Eex nA [ib] IIC T4                                            |
| <b>Dimensions and weight</b>                         |                                                                         |
| Dimensions                                           |                                                                         |
| • Width                                              | 40 mm                                                                   |
| • Height                                             | 125 mm                                                                  |
| • Depth                                              | 120 mm                                                                  |
| Weight                                               |                                                                         |
| • Weight, approx.                                    | 260 g                                                                   |

## Ordering data

## Order No.

|                                                                                                      |   |                            |
|------------------------------------------------------------------------------------------------------|---|----------------------------|
| <b>SM 331 HART analog input module</b>                                                               |   | <b>6ES7 331-7TB00-0AB0</b> |
| 2 inputs, 0/4 ... 20 mA, HART for ET 200M with IM 153-2 interface module                             |   |                            |
| <b>Accessories</b>                                                                                   |   |                            |
| <b>Front connector<sup>1)</sup></b>                                                                  |   |                            |
| 20-pin, with screw contacts                                                                          |   |                            |
| • 1 unit                                                                                             |   | <b>6ES7 392-1AJ00-0AA0</b> |
| • 100 units                                                                                          |   | <b>6ES7 392-1AJ00-1AB0</b> |
| <b>LK 393 cable guide</b>                                                                            |   | <b>6ES7 393-4AA00-0AA0</b> |
| Mandatory for operation in hazardous areas                                                           |   |                            |
| <b>SIMATIC DP mounting rail for ET 200M</b>                                                          |   |                            |
| For mounting of up to 5 bus modules for                                                              |   |                            |
| • Length: 483 mm                                                                                     |   | <b>6ES7 195-1GA00-0XA0</b> |
| • Length: 530 mm                                                                                     |   | <b>6ES7 195-1GF30-0XA0</b> |
| <b>SIMATIC S7-300 mounting rail</b>                                                                  |   |                            |
| • Length: 160 mm                                                                                     |   | <b>6ES7 390-1AB60-0AA0</b> |
| • Length: 480 mm                                                                                     |   | <b>6ES7 390-1AE80-0AA0</b> |
| • Length: 530 mm                                                                                     |   | <b>6ES7 390-1AF30-0AA0</b> |
| • Length: 830 mm                                                                                     |   | <b>6ES7 390-1AJ30-0AA0</b> |
| • Length: 2000 mm                                                                                    |   | <b>6ES7 390-1BC00-0AA0</b> |
| <b>Label cover</b>                                                                                   |   | <b>6ES7 392-2XY00-0AA0</b> |
| (10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM |   |                            |
| <b>Labeling strips</b>                                                                               |   | <b>6ES7 392-2XX00-0AA0</b> |
| (10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM |   |                            |
| <b>S7-SmartLabel V3.0</b>                                                                            |   |                            |
| Software for machine labeling of modules directly from the STEP 7 project                            |   |                            |
| Single License                                                                                       | J | <b>2XV9 450-1SL03-0YX0</b> |
| Upgrade Single License                                                                               | J | <b>2XV9 450-1SL03-0YX4</b> |
| <b>Labeling sheets for machine printing</b>                                                          |   |                            |
| For 16-channel signal modules, DIN A4, for printing with laser printers; 10 units                    |   |                            |
| petrol                                                                                               |   | <b>6ES7 392-2AX00-0AA0</b> |
| light beige                                                                                          |   | <b>6ES7 392-2BX00-0AA0</b> |
| yellow                                                                                               |   | <b>6ES7 392-2CX00-0AA0</b> |
| red                                                                                                  |   | <b>6ES7 392-2DX00-0AA0</b> |

<sup>1)</sup> A connector with spring-loaded terminals cannot be used if the cable guide is used.

I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S



## SIMATIC ET 200 distributed I/O

## ET 200M

## I/O modules

## Ex analog output module with HART

## Overview



- For using HART devices in hazardous areas
- Can only be plugged into ET 200M
- 2 AO HART, Ex
- 2 current outputs in 2 channel groups (single-channel isolation)
- Output type and range can be selected for each channel
- Diagnostics and diagnostic alarm parameterizable
- Read-back capability of the analog outputs

## Technical specifications

| 6ES7 332-5TB00-0AB0                                                 |                                                      |
|---------------------------------------------------------------------|------------------------------------------------------|
| <b>Supply voltages</b>                                              |                                                      |
| Load voltage L+                                                     |                                                      |
| • Rated value (DC)                                                  | 24 V                                                 |
| • Reverse polarity protection                                       | Yes                                                  |
| <b>Current consumption</b>                                          |                                                      |
| from backplane bus 5 V DC, max.                                     | 100 mA                                               |
| from supply voltage L+, max.                                        | 150 mA                                               |
| <b>Power losses</b>                                                 |                                                      |
| Power loss, typ.                                                    | 3.5 W                                                |
| <b>Analog outputs</b>                                               |                                                      |
| Number of analog outputs                                            | 2                                                    |
| Cable length, shielded, max.                                        | 400 m                                                |
| Voltage output, short-circuit protection                            | Yes                                                  |
| Current output, no-load voltage, max.                               | 19 V                                                 |
| Cycle time (all channels) max.                                      | 5 ms                                                 |
| Output ranges, current                                              |                                                      |
| • 0 to 20 mA                                                        | Yes                                                  |
| • 4 to 20 mA                                                        | Yes                                                  |
| Connection of actuators                                             |                                                      |
| • for current output 2-conductor connection                         | Yes                                                  |
| Load impedance (in rated range of output)                           |                                                      |
| • with current outputs, max.                                        | 650 $\Omega$                                         |
| • with current outputs, inductive load, max.                        | 7.5 mH                                               |
| Destruction limits against externally applied voltages and currents |                                                      |
| • Voltages at the outputs towards MANA                              | max. 17 V / -0.5 V                                   |
| • Current, max.                                                     | 60 mA / -1 A                                         |
| <b>Analog value creation</b>                                        |                                                      |
| Integrations and conversion time/resolution per channel             |                                                      |
| • Resolution with overrange (bit including sign), max.              | 12 bit; Output value; 8 bit (+ sign) read back value |
| • Conversion time (per channel)                                     | 40 ms                                                |

| 6ES7 332-5TB00-0AB0                                                  |             |
|----------------------------------------------------------------------|-------------|
| Settling time                                                        |             |
| • for resistive load                                                 | 2.5 ms      |
| • for capacitive load                                                | 4 ms        |
| • for inductive load                                                 | 2.5 ms      |
| <b>Ex(i) characteristics</b>                                         |             |
| Module for Ex(i) protection                                          | Yes         |
| Max. values of output circuits (per channel)                         |             |
| • Co (permissible external capacity), max.                           | 230 nF      |
| • Io (short-circuit current), max.                                   | 66 mA       |
| • Lo (permissible external inductivity), max.                        | 7.5 mH      |
| • Po (power of load), max.                                           | 506 mW      |
| • Uo (output no-load voltage), max.                                  | 19 V        |
| • Um (fault voltage), max.                                           | 60 V; DC    |
| • Ta (permissible ambient temperature), max.                         | 60 °C       |
| <b>Errors/accuracies</b>                                             |             |
| Output ripple (based on output area, bandwidth 0 to 50 kHz)          | +/- 0.02 %  |
| Linearity error (relative to output area)                            | +/- 0.03 %  |
| Temperature error (relative to output area)                          | +/- 0.01 %  |
| Crosstalk between the outputs, min.                                  | 130 dB      |
| Repeat accuracy in settled status at 25 °C (relative to output area) | +/- 0.005 % |
| Operational limit in overall temperature range                       |             |
| • Current, relative to output area                                   | +/- 0.55 %  |
| Basic error limit (operational limit at 25 °C)                       |             |
| • Current, relative to output area                                   | +/- 0.15 %  |

## Technical specifications (continued)

| 6ES7 332-5TB00-0AB0                                  |                                           |
|------------------------------------------------------|-------------------------------------------|
| <b>Alarms/diagnostics/status information</b>         |                                           |
| Substitute values connectable                        | Yes; Parameterizable                      |
| Alarms                                               |                                           |
| • Diagnostic alarm                                   | Yes; Parameterizable                      |
| Diagnostics                                          |                                           |
| • Diagnostic functions                               | Yes; Parameterizable                      |
| • Diagnostic information readable                    | Yes                                       |
| • Diagnostics                                        | Yes                                       |
| • Overrange                                          | Yes                                       |
| • Wire break                                         | Yes; as of output value > 0.5 mA          |
| • Wire break in actuator cable                       | Yes                                       |
| • HART communication active                          | Yes; green LED (H)                        |
| Diagnostic indication LED                            |                                           |
| • Group error SF (red)                               | Yes; Additional group message per channel |
| • Channel error indicator F (red)                    | Yes; per channel                          |
| <b>Isolation</b>                                     |                                           |
| tested with                                          |                                           |
| • Channels against backplane bus and load voltage L+ | 1500 V AC                                 |
| • Channels among one another                         | 1500 V AC                                 |
| • Load voltage L+ against backplane bus              | 500 V DC                                  |

| 6ES7 332-5TB00-0AB0                            |                                                                         |
|------------------------------------------------|-------------------------------------------------------------------------|
| <b>Galvanic isolation</b>                      |                                                                         |
| between the channels and backplane bus         | Yes                                                                     |
| Galvanic isolation analog outputs              |                                                                         |
| • Galvanic isolation analog outputs            | Yes                                                                     |
| • between the channels                         | Yes                                                                     |
| • between the channels and the load voltage L+ | Yes                                                                     |
| <b>Permissible potential difference</b>        |                                                                         |
| between the outputs (UCM)                      | 60 V DC/30 V AC                                                         |
| between M internally and the outputs           | 60 V DC / 30 V AC                                                       |
| <b>Standards, approvals, certificates</b>      |                                                                         |
| FM approval                                    | Available soon                                                          |
| Type of protection acc. to EN 50020 (CENELEC)  | [Ex ib] IIC                                                             |
| Type of protection acc. to FM                  | Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4 |
| Test number KEMA                               | 97 ATEX 2359 X                                                          |
| Type of protection acc. to KEMA                | II3 (2) G Eex nA [ib] IIC T4                                            |
| <b>Dimensions and weight</b>                   |                                                                         |
| Dimensions                                     |                                                                         |
| • Width                                        | 40 mm                                                                   |
| • Height                                       | 125 mm                                                                  |
| • Depth                                        | 120 mm                                                                  |
| Weight                                         |                                                                         |
| • Weight, approx.                              | 280 g                                                                   |

## SIMATIC ET 200 distributed I/O

## ET 200M

## I/O modules

## Ex analog output module with HART

| Ordering data                                                                                                                                                                                                | Order No.                                                                                                                                          | Order No.                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SM 332 HART analog output module</b><br><br>HART analog output, 8 outputs, 0/4 ... 20 mA, HART for ET 200M with IM 153-2                                                                                  | <b>6ES7 332-5TB00-0AB0</b>                                                                                                                         | <b>S7-SmartLabel V3.0</b><br><br>Software for machine labeling of modules directly from the STEP 7 project<br><br>Single License J <b>2XV9 450-1SL03-0YX0</b><br><br>Upgrade Single License J <b>2XV9 450-1SL03-0YX4</b>                                                                                                |
| <b>Accessories</b>                                                                                                                                                                                           |                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                         |
| <b>Front connectors</b><br><br>20-pin, with screw contacts<br><ul style="list-style-type: none"><li>• 1 unit</li><li>• 100 units</li></ul>                                                                   | <b>6ES7 392-1AJ00-0AA0</b><br><b>6ES7 392-1AJ00-1AB0</b>                                                                                           |                                                                                                                                                                                                                                                                                                                         |
| <b>LK 393 cable guide</b><br><br>Mandatory for operation in hazardous areas                                                                                                                                  | <b>6ES7 393-4AA00-0AA0</b>                                                                                                                         |                                                                                                                                                                                                                                                                                                                         |
| <b>SIMATIC DP mounting rail for ET 200M</b><br><br>For mounting of up to 5 bus modules for<br><ul style="list-style-type: none"><li>• Length: 483 mm</li><li>• Length: 530 mm</li></ul>                      | <b>6ES7 195-1GA00-0XA0</b><br><b>6ES7 195-1GF30-0XA0</b>                                                                                           | <b>Labeling sheets for machine printing</b><br><br>For 16-channel signal modules, DIN A4, for printing with laser printers; 10 units<br><br>petrol <b>6ES7 392-2AX00-0AA0</b><br><br>light beige <b>6ES7 392-2BX00-0AA0</b><br><br>yellow <b>6ES7 392-2CX00-0AA0</b><br><br>red <b>6ES7 392-2DX00-0AA0</b>              |
| <b>SIMATIC S7-300 mounting rail</b><br><ul style="list-style-type: none"><li>• Length: 160 mm</li><li>• Length: 480 mm</li><li>• Length: 530 mm</li><li>• Length: 830 mm</li><li>• Length: 2000 mm</li></ul> | <b>6ES7 390-1AB60-0AA0</b><br><b>6ES7 390-1AE80-0AA0</b><br><b>6ES7 390-1AF30-0AA0</b><br><b>6ES7 390-1AJ30-0AA0</b><br><b>6ES7 390-1BC00-0AA0</b> |                                                                                                                                                                                                                                                                                                                         |
| <b>Label cover</b><br><br>(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM                                                                               | <b>6ES7 392-2XY00-0AA0</b>                                                                                                                         |                                                                                                                                                                                                                                                                                                                         |
| <b>Labeling strips</b><br><br>(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM                                                                           | <b>6ES7 392-2XX00-0AA0</b>                                                                                                                         |                                                                                                                                                                                                                                                                                                                         |
|                                                                                                                                                                                                              |                                                                                                                                                    | <b>S7 Manual Collection</b> J <b>6ES7 998-8XC01-8YE0</b><br><br>Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication) |
|                                                                                                                                                                                                              |                                                                                                                                                    | <b>S7 Manual Collection update service for 1 year</b> D <b>6ES7 998-8XC01-8YE2</b><br><br>Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates                                                                                                                                        |

D: Subject to export regulations AL: N and ECCN: 5D992

I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S

## Overview



- Can only be plugged into ET 200M with IM153-2 and IM 153-2 FO
- 8 AI HART
- Redundant connection
- Firmware update
- HART secondary variables

**Note:**

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**SIPLUS analog input module with HART**

|                                                                                |                                                                                                                                                                                 |                            |
|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Order No.</b>                                                               | <b>6AG1 331-7TF01-7AB0</b>                                                                                                                                                      | <b>6AG1 331-7TF01-4AB0</b> |
| <b>Order No. based on</b>                                                      | <b>6ES7 331-7TF01-0AB0</b>                                                                                                                                                      | <b>6ES7 331-7TF01-0AB0</b> |
| Ambient temperature range                                                      | -25 °C to +70 °C                                                                                                                                                                | 0 °C to +60 °C             |
| Conformal coating                                                              | Coating of the printed circuit boards and the electronic components                                                                                                             |                            |
| Technical data                                                                 | The technical data of the standard product applies except for the ambient conditions.                                                                                           |                            |
| <b>Ambient conditions</b>                                                      |                                                                                                                                                                                 |                            |
| • Relative humidity                                                            | 5 ... 100 %<br>Condensation permissible                                                                                                                                         |                            |
| • Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                   |                            |
| • Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                           |                            |
| • Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                           |                            |
| • Air pressure (depending on the highest positive temperature range specified) | 1080 ... 795 hPa (-1000 ... +2000 m)<br>See ambient temperature range<br>795...658 hPa (+2000 ... +3500 m)<br>Derating 10 K<br>658...540 hPa (+3500 ... +5000m)<br>Derating 20K |                            |

- 1) ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm; H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O<sub>3</sub> < 0.1 ppm; NOX < 5.2 ppm Threshold / limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O<sub>3</sub> < 1.0 ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

**Ordering data****Order No.****SM 331 HART analog input module**

(extended temperature range and medial exposure)

8 inputs, 0/4 to 20 mA, HART for ET 200M with IM 153-2 interface module

**6AG1 331-7TF01-7AB0**

8 inputs, 0/4 to 20 mA, HART for ET 200M with IM 153-2 interface module; only medial exposure

**6AG1 331-7TF01-4AB0**

**Accessories**

see SIMATIC ET 200M analog module with HART, page 9/195

H: Subject to export regulations AL: 91999 and ECCN: EAR99H

## SIMATIC ET 200 distributed I/O

## ET 200M

## SIPLUS I/O modules

## SIPLUS analog output module with HART

## Overview



- Pluggable exclusively in ET 200M with IM 153-2 and IM 153-2 FO
- 8 AI HART
- Redundant connection
- Firmware update
- HART secondary variables

**Note:**

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**SIPLUS S7-300 SM332 8AO HART**

|                           |                                                                                       |                            |
|---------------------------|---------------------------------------------------------------------------------------|----------------------------|
| <b>Order No.</b>          | <b>6AG1 332-8TF01-2AB0</b>                                                            | <b>6AG1 332-8TF01-4AB0</b> |
| <b>Order No. based on</b> | <b>6ES7 332-8TF01-0AB0</b>                                                            | <b>6ES7 332-8TF01-0AB0</b> |
| Ambient temperature range | -25 °C to +60 °C                                                                      | 0 °C to +60 °C             |
| Conformal coating         | Coating of the printed circuit boards and the electronic components                   |                            |
| Technical data            | The technical data of the standard product applies except for the ambient conditions. |                            |

**Ambient conditions**

|                                                                                |                                                                                                                                                                               |
|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| • Relative humidity                                                            | 5 ... 100 %, condensation permitted                                                                                                                                           |
| • Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                 |
| • Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                         |
| • Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                         |
| • Air pressure (depending on the highest positive temperature range specified) | 1080...795 hPa (-1000 ... +2000 m)<br>See ambient temperature range<br>795...658 hPa (+2000 ... +3500 m)<br>Derating 10 K<br>658...540 hPa (+3500 ... +5000m)<br>Derating 20K |

- <sup>1)</sup> ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> <4.8 ppm; H<sub>2</sub>S <9.9 ppm; Cl <0.2 ppm; HCl <0.66 ppm; HF <0.12 ppm; NH<sub>3</sub> <49 ppm; O<sub>3</sub> <0.1 ppm; NOX <5.2 ppm Threshold / limit value (max. 30 min/d): SO<sub>2</sub> <17.8 ppm; H<sub>2</sub>S <49.7 ppm; Cl <1.0 ppm; HCl <3.3 ppm; HF <2.4 ppm; NH<sub>3</sub> <247 ppm; O<sub>3</sub> <1.0 ppm; NOX <10.4 ppm
- <sup>2)</sup> The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

| Ordering data                                                               | Order No.                                                     |
|-----------------------------------------------------------------------------|---------------------------------------------------------------|
| <b>SIPLUS SM 332 analog output module with HART</b><br>(medial exposure)    |                                                               |
| HART analog output, 8 outputs, 0/4 - 20 mA, HART for ET 200M, with IM 153-2 | <b>6AG1 332-8TF01-4AB0</b>                                    |
| Additionally with expanded temperature range                                | <b>6AG1 332-8TF01-2AB0</b>                                    |
| <b>Accessories</b>                                                          | See SIMATIC SM 332 analog output module with HART, page 9/197 |

H: Subject to export regulations AL: 9I999 and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200M

### SIPLUS I/O modules

#### SIPLUS Ex analog input module with HART

## Overview



- For connecting HART devices in hazardous areas.
- Can only be plugged into ET 200M
- 2 AI HART, Ex
- 2 inputs in 2 channel groups (single-channel isolation)
- Measurement type/range can be selected for each channel
- Programmable diagnostics and diagnostic interrupt

### Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### SIPLUS Ex analog input module with HART

|                                                                                |                                                                                                                                                                                 |                     |
|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Order No.                                                                      | 6AG1 331-7TB00-7AB0                                                                                                                                                             | 6AG1 331-7TB00-4AB0 |
| Order No. based on                                                             | 6ES7 331-7TB00-0AB0                                                                                                                                                             | 6ES7 331-7TB00-0AB0 |
| Ambient temperature range                                                      | -25 °C to +70 °C                                                                                                                                                                | 0 °C to +60 °C      |
| Conformal coating                                                              | Coating of the printed circuit boards and the electronic components                                                                                                             |                     |
| Technical data                                                                 | The technical data of the standard product applies except for the ambient conditions.                                                                                           |                     |
| <b>Ambient conditions</b>                                                      |                                                                                                                                                                                 |                     |
| • Relative humidity                                                            | 5 ... 100 %<br>Condensation permissible                                                                                                                                         |                     |
| • Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                   |                     |
| • Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                           |                     |
| • Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                           |                     |
| • Air pressure (depending on the highest positive temperature range specified) | 1080 ... 795 hPa (-1000 ... +2000 m)<br>See ambient temperature range<br>795...658 hPa (+2000 ... +3500 m)<br>Derating 10 K<br>658...540 hPa (+3500 ... +5000m)<br>Derating 20K |                     |

- 1) ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm; H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH < 49 ppm; O<sub>3</sub> < 0.1 ppm; NOX < 5.2 ppm Threshold / limit value (max. 30 min/d): SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH < 247 ppm; O<sub>3</sub> < 1.0 ppm; NOX < 10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

### Ordering data

### Order No.

#### SM 331 HART analog input module

(extended temperature range and medial exposure)

2 inputs, 0/4 to 20 mA, HART for ET 200M with IM 153-2 interface module

**6AG1 331-7TB00-7AB0**

2 inputs, 0/4 to 20 mA, HART for ET 200M with IM 153-2 interface module; only medial exposure

**6AG1 331-7TB00-4AB0**

#### Accessories

see SIMATIC ET 200M Ex analog input module with HART, page 9/199

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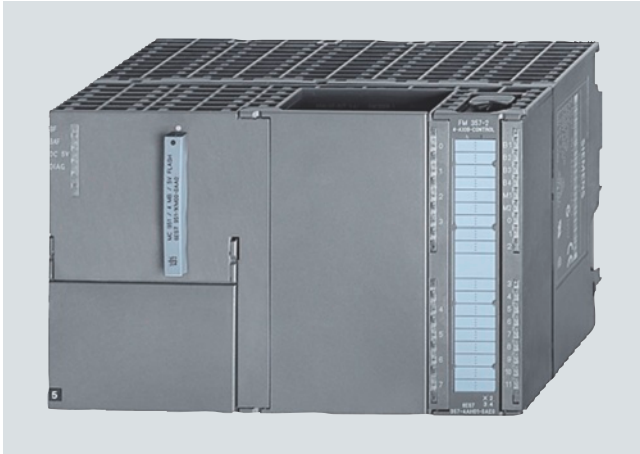
I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200M

### Function modules

#### Overview



Function modules unburden the CPU of work-intensive tasks such as counting, positioning and controlling

#### Module spectrum

- Counter modules
- Positioning modules for rapid traverse and creep speed drives
- Positioning modules for stepper motors
- Positioning modules for servo motors
- Positioning and continuous path modules
- SSI position detection modules
- Electronic cam controllers
- High-speed Boolean processor
- Control modules

#### Function modules

|                                            |                                                                    |
|--------------------------------------------|--------------------------------------------------------------------|
| Counting                                   | FM 350-1 counter module<br>FM 350-2 counter module                 |
| Positioning                                | FM 351 positioning module                                          |
| • of rapid traverse and creep speed drives |                                                                    |
| • of stepper motors                        | FM 353 positioning module                                          |
| • of servo motors                          | FM 354 positioning module                                          |
| Position and path control                  | FM 357-2 path and position control module <sup>1)</sup>            |
| SSI position detection                     | SM 338 POS input modules                                           |
| Electronic cam control                     | FM352 electronic cam controller                                    |
| High speed logic operation                 | FM 352-5 high speed Boolean processor                              |
| Controlling                                | FM 355 controller module<br>FM 355-2 temperature controller module |
| Weighing and proportioning electronics     | SIWAREX                                                            |

<sup>1)</sup> Not for ET 200M

**Overview** (continued)**Applicability with ET 200M distributed I/O device**

Almost all function modules can be used in the ET 200M distributed I/O device. In doing so, the following details must be observed:

| Module                                   | Order No.           | For plugging in behind IM 153-1 (6ES7 153-1AA03-0XB0) |                          | For plugging in behind IM 153-2 (6ES7 153-2BA02-0XB0) |                          | For plugging in behind IM 153-2 FO (6ES7 153-2BB00-0XB0) |                          | For plugging in behind IM 153-4 PN (6ES7 153-4AA00-0XB0) |
|------------------------------------------|---------------------|-------------------------------------------------------|--------------------------|-------------------------------------------------------|--------------------------|----------------------------------------------------------|--------------------------|----------------------------------------------------------|
|                                          |                     | configurable with STEP 7 <sup>1)</sup>                | GSD <sup>2)</sup>        | STEP 7 <sup>1)</sup>                                  | GSD <sup>2)</sup>        | STEP 7 <sup>1)</sup>                                     | GSD <sup>2)</sup>        | STEP 7 <sup>1)</sup>                                     |
| FM 350-1 counter module                  | 6ES7 350-1AH03-0AE0 | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                                 | --                       | <input type="checkbox"/>                                 |
| FM 350-2 counter module                  | 6ES7 350-2AH01-0AE0 | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                                 | --                       | <input type="checkbox"/>                                 |
| FM 351 positioning module                | 6ES7 351-1AH01-0AE0 | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                                 | --                       | <input type="checkbox"/>                                 |
| FM 352 cam controller                    | 6ES7 352-1AH02-0AE0 | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                                 | --                       | <input type="checkbox"/>                                 |
| FM 352-5 high speed Boolean processor    | 6ES7 352-5AH00-0AE0 | <input checked="" type="checkbox"/> <sup>3)</sup>     | <input type="checkbox"/> | <input checked="" type="checkbox"/> <sup>3)</sup>     | <input type="checkbox"/> | <input checked="" type="checkbox"/> <sup>3)</sup>        | <input type="checkbox"/> | <input type="checkbox"/>                                 |
| FM 352-5 high speed Boolean processor    | 6ES7 352-5AH10-0AE0 | <input checked="" type="checkbox"/> <sup>3)</sup>     | <input type="checkbox"/> | <input checked="" type="checkbox"/> <sup>3)</sup>     | <input type="checkbox"/> | <input checked="" type="checkbox"/> <sup>3)</sup>        | <input type="checkbox"/> | <input type="checkbox"/>                                 |
| FM 353 positioning module                | 6ES7 353-1AH01-0AE0 | --                                                    | --                       | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                                 | --                       | --                                                       |
| FM 354 positioning module                | 6ES7 354-1AH01-0AE0 | --                                                    | --                       | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                                 | --                       | --                                                       |
| FM 355 C controller module               | 6ES7 355-0VH10-0AE0 | --                                                    | --                       | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                                 | --                       | <input type="checkbox"/>                                 |
| FM 355 S controller module               | 6ES7 355-1VH10-0AE0 | --                                                    | --                       | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                                 | --                       | <input type="checkbox"/>                                 |
| FM 355-2 C temperature controller module | 6ES7 355-2CH00-0AE0 | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                                 | --                       | <input type="checkbox"/>                                 |
| FM 355-2 S temperature controller module | 6ES7 355-2SH00-0AE0 | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                              | --                       | <input type="checkbox"/>                                 | --                       | <input type="checkbox"/>                                 |
| SM 338 POS input module                  | 6ES7 338-4BC01-0AB0 | <input type="checkbox"/>                              | <input type="checkbox"/> | <input type="checkbox"/>                              | <input type="checkbox"/> | <input type="checkbox"/>                                 | <input type="checkbox"/> | <input type="checkbox"/>                                 |

☐: configurable

--: not configurable

<sup>1)</sup> Configuration using the meta-knowledge integrated into STEP 7 (in hardware catalog under PROFIBUS DP > ET200M > IM 153-1 / IM 153-2 or PROFINET IO > I/O > ET 200M > IM153-4 PN).

<sup>2)</sup> Configuration using GSD file (after installation of the GSD file configurable from the Hardware Catalog under PROFIBUS DP > Additional field devices > I/O > ET200M). During configuration on the CP 342-5 as DP master, S5 (IM 308C) as DP master or external masters, the GSD file must be configured.

<sup>3)</sup> Visible and configurable only with the corresponding configuration package in STEP 7.

**Note:**

Position measurement systems and prefabricated connecting cables for counter and positioning function are offered under SIMODRIVE Sensor and Motion Connect 500.

[www.siemens.com/simatic-technology](http://www.siemens.com/simatic-technology)

For further information see SIMATIC S7-300, Chapter 5.



# SIMATIC ET 200 distributed I/O

## ET 200M

### Special modules, communication

#### Overview special modules



The special modules offer functions for diagnostics as well as commissioning to the user.

For further information see SIMATIC S7-300, Chapter 5.

#### Overview Communication



- Communication modules for data exchange using point-to-point coupling
- Communication modules for the connection of identification systems

For further information see SIMATIC S7-300, Chapter 5.

## Overview



The ASM 475 is a low-cost module for connecting the MOBY D, U, SIMATIC RF200, RF300, RF600 and SIMATIC MV400 identification systems to the S7-300 and ET 200M.

## Technical specifications

| Communication modules                           | ASM 475                                                                             | ASM 475 (with MOBY U file handler)              |
|-------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------|
| Serial interface to the reader                  | RS422                                                                               |                                                 |
| Connection point for reader                     | Max. 2 units via screw or spring-loaded terminals in the front connector            |                                                 |
| Interface/cable length, max. connectable length | RS422 / 1 000 m, depending on reader and cable type                                 |                                                 |
| Readers that can be connected                   | MOBY U/D, RF 200 / RF300 / RF600, MV400                                             | MOBY U                                          |
| Interface for 24 V DC                           | Via screw terminals in front connector                                              |                                                 |
| SIMATIC S7 function blocks                      | FC/FB45, FC55 (multitag)                                                            | FC56                                            |
| Transponder addressing                          | Direct access via addresses                                                         | Access via DOS-like file system                 |
| Commands                                        | Initialize transponder, read data from transponder, write data to transponder, etc. | Format transponder, read file, write file, etc. |
| Supply voltage                                  |                                                                                     |                                                 |
| • Rated value                                   | 24 V DC                                                                             |                                                 |
| • Permissible range                             | 20 ... 30 V DC                                                                      |                                                 |
| Electrical isolation between S7-300 and MOBY    | Yes                                                                                 |                                                 |
| Current consumption from S7 bus terminal, max.  | 100 mA                                                                              |                                                 |
| Power loss, typically                           | 1 W                                                                                 |                                                 |
| Ambient temperature                             |                                                                                     |                                                 |
| During operation                                |                                                                                     |                                                 |
| • Horizontal configuration of SIMATIC           | 0 ... +60 °C                                                                        |                                                 |
| • Vertical configuration of SIMATIC             | 0 ... +40 °C                                                                        |                                                 |
| During transportation and storage               | -40 ... +70 °C                                                                      |                                                 |
| Dimensions W x H x D (mm)                       | 40 x 125 x 120                                                                      |                                                 |
| Weight                                          | Approx. 0.2 kg                                                                      |                                                 |

# SIMATIC ET 200 distributed I/O

## ET 200M

### ASM 475

| Ordering data                                                                                                                                                                                                                                                                                                           | Order No.                                                                                                                                                                                                                         | Order No.                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MOBY ASM 475 communication module</b><br>for SIMATIC S7-300 and ET 200M, parameterizable<br><b>Accessories</b><br><b>Front connector (1 x per ASM 475)</b> <ul style="list-style-type: none"> <li>• with screw terminals</li> <li>• with spring-loaded terminals</li> </ul>                                          | <b>6GT2 002-0GA10</b><br><br><b>6ES7 392-1AJ00-0AA0</b><br><b>6ES7 392-1BJ00-0AA0</b>                                                                                                                                             | <b>SIMATIC RF200 / RF300 / RF600 / MV400 connecting cable</b><br>preassembled, between the ASM 475 and RF200 / RF300 / RF600 / MV400, IP65, straight connector, PUR material, suitable for cable carriers, CMG approval, in the following lengths <sup>1)</sup> :<br>2 m<br>5 m<br><b>6GT2 891-4EH20</b><br><b>6GT2 891-4EH50</b> |
| <b>MOBY U connecting cable</b><br>preassembled, between the ASM 475 and reader, angled connector, PUR material, in the following lengths:<br>2 m<br>5 m<br>10 m<br>20 m<br>50 m<br>pre-assembled, between ASM 475 and reader, straight connector, PUR material, in the following lengths:<br>2 m<br>5 m<br>10 m<br>50 m | <b>6GT2 091-4EH20</b><br><b>6GT2 091-4EH50</b><br><b>6GT2 091-4EN10</b><br><b>6GT2 091-4EN20</b><br><b>6GT2 091-4EN50</b><br><br><b>6GT2 091-6EH20</b><br><b>6GT2 091-6EH50</b><br><b>6GT2 091-6EN10</b><br><b>6GT2 091-6EN50</b> | <b>Extension cable</b><br>SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, CMG approval, suitable for cable carriers, straight connector<br>2 m<br>5 m<br>10 m<br>20 m<br>50 m<br><b>6GT2 891-4FH20</b><br><b>6GT2 891-4FH50</b><br><b>6GT2 891-4FN10</b><br><b>6GT2 891-4FN20</b><br><b>6GT2 891-4FN50</b>                   |
| <b>MOBY D connecting cable</b><br>preassembled, between ASM 475 and reader D1xS, 9-pole Sub-D plug, PUR material, CMG approved, suitable for cable carriers, in the following lengths:<br>5 m<br>20 m<br>50 m                                                                                                           | <b>6GT2 491-4EH50</b><br><b>6GT2 491-4EN20</b><br><b>6GT2 491-4EN50</b>                                                                                                                                                           | <b>DVD "RFID Systems Software &amp; Documentation"</b><br><b>6GT2 080-2AA20</b>                                                                                                                                                                                                                                                   |

<sup>1)</sup> The connecting cables can be extended using the RF300 connecting cables of type 6GT2891-4Fxxx. These connecting cables are available in the lengths 2 m, 5 m, 10 m, 20 m and 50 m.

J: Subject to export regulations AL: N and ECCN: EAR99S

#### Overview



- Load current supplies for S7-300/ET 200M
- To convert the line voltage to the required operating voltage 24 V DC
- Output current 2 A, 5 A or 10 A

For further information see SIMATIC S7-300, Chapter 5.

# SIMATIC ET 200 distributed I/O

## ET 200L

### ET 200L

#### Application



ET 200L is a small, compact I/O device with degree of protection IP20.

The ET 200L is mainly used for applications in the low-end performance range which require few inputs/outputs as well as for applications where space is limited.

The ET 200L is a passive node (slave) on PROFIBUS DP with transmission rates up to 1.5 Mbit/s.

#### Technical specifications

|                                                      | 6ES7 131-1BH01-0XB0                                                                                                      | 6ES7 131-1BL01-0XB0                                                                                                      |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                               |                                                                                                                          |                                                                                                                          |
| Rated value                                          |                                                                                                                          |                                                                                                                          |
| • 24 V DC                                            | Yes                                                                                                                      | Yes                                                                                                                      |
| • Reverse polarity protection                        | Yes                                                                                                                      | Yes                                                                                                                      |
| <b>Hardware configuration</b>                        |                                                                                                                          |                                                                                                                          |
| Rack                                                 |                                                                                                                          |                                                                                                                          |
| • Required terminal block                            | TB 16L                                                                                                                   | TB 32L                                                                                                                   |
| <b>Connection method</b>                             |                                                                                                                          |                                                                                                                          |
| Inputs/outputs                                       | Screw-type and spring-loaded terminals, permanent wiring; standard: 2-wire connection, optional: 3 and 4-wire connection | Screw-type and spring-loaded terminals, permanent wiring; standard: 2-wire connection, optional: 3 and 4-wire connection |
| <b>PROFIBUS DP</b>                                   |                                                                                                                          |                                                                                                                          |
| Transmission rate, max.                              | 1.5 Mbit/s                                                                                                               | 1.5 Mbit/s                                                                                                               |
| Direct data exchange (slave-to-slave communication)  | Yes; Transmitter (for digital outputs and hybrid modules ET 200L: not for L-SC or IM-SC)                                 | Yes; Transmitter (for digital outputs and hybrid modules ET 200L: not for L-SC or IM-SC)                                 |
| <b>Digital inputs</b>                                |                                                                                                                          |                                                                                                                          |
| Number of digital inputs                             | 16                                                                                                                       | 32                                                                                                                       |
| Input voltage                                        |                                                                                                                          |                                                                                                                          |
| • Rated value, DC                                    | 24 V                                                                                                                     | 24 V                                                                                                                     |
| • for signal "0"                                     | -30 to +5 V                                                                                                              | -30 to +5 V                                                                                                              |
| • for signal "1"                                     | 13 to 30 V                                                                                                               | 13 to 30 V                                                                                                               |
| Input current                                        |                                                                                                                          |                                                                                                                          |
| • for signal "1", typ.                               | 5 mA                                                                                                                     | 5 mA                                                                                                                     |
| Input delay (for rated value of input voltage)       |                                                                                                                          |                                                                                                                          |
| • for standard inputs                                |                                                                                                                          |                                                                                                                          |
| - at "0" to "1", min.                                | 2 ms                                                                                                                     | 2 ms                                                                                                                     |
| - at "0" to "1", max.                                | 4.5 ms                                                                                                                   | 4.5 ms                                                                                                                   |
| Cable length                                         |                                                                                                                          |                                                                                                                          |
| • Cable length for NAMUR input, shielded, max.       | 1 000 m                                                                                                                  | 1 000 m                                                                                                                  |
| <b>Galvanic isolation</b>                            |                                                                                                                          |                                                                                                                          |
| between PROFIBUS DP and all other circuit components | Yes                                                                                                                      | Yes                                                                                                                      |
| Galvanic isolation digital inputs                    |                                                                                                                          |                                                                                                                          |
| • between the channels                               | No                                                                                                                       | No                                                                                                                       |
| • between the channels and PROFIBUS DP               | Yes                                                                                                                      | Yes                                                                                                                      |

**Technical specifications (continued)**

|                                                 | 6ES7 131-1BH01-0XB0                                                                                          | 6ES7 131-1BL01-0XB0                                                                                          |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Environmental requirements</b>               |                                                                                                              |                                                                                                              |
| Operating temperature                           |                                                                                                              |                                                                                                              |
| • Horizontal installation, min.                 | 0 °C                                                                                                         | 0 °C                                                                                                         |
| • Horizontal installation, max.                 | 60 °C; 40°C for other mountings                                                                              | 60 °C; 40°C for other mountings                                                                              |
| Air pressure                                    |                                                                                                              |                                                                                                              |
| • Permissible range, min.                       | 795 hPa                                                                                                      | 795 hPa                                                                                                      |
| • Permissible range, max.                       | 1 080 hPa                                                                                                    | 1 080 hPa                                                                                                    |
| Relative humidity                               |                                                                                                              |                                                                                                              |
| • Operation, min.                               | 5 %                                                                                                          | 5 %                                                                                                          |
| • Operation, max.                               | 95 %; RH class 2 in accordance with IEC 1131-2                                                               | 95 %; RH class 2 in accordance with IEC 1131-2                                                               |
| Vibrations                                      |                                                                                                              |                                                                                                              |
| • Operation, checked according to IEC 60068-2-6 | Yes; IEC 68, Part 2-6; 10 to 57 Hz; (constant amplitude 0.075 mm); 57 to 150 Hz; (constant acceleration 1 g) | Yes; IEC 68, Part 2-6; 10 to 57 Hz; (constant amplitude 0.075 mm); 57 to 150 Hz; (constant acceleration 1 g) |
| Shock test                                      |                                                                                                              |                                                                                                              |
| • checked according to IEC 60068-2-27           | Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms                                                               | Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms                                                               |
| <b>Degree of protection</b>                     |                                                                                                              |                                                                                                              |
| IP20                                            | Yes                                                                                                          | Yes                                                                                                          |
| <b>Dimensions and weight</b>                    |                                                                                                              |                                                                                                              |
| Dimensions                                      |                                                                                                              |                                                                                                              |
| • Width                                         | 145 mm                                                                                                       | 145 mm                                                                                                       |
| • Height                                        | 60 mm                                                                                                        | 60 mm                                                                                                        |
| • Depth                                         | 60.5 mm                                                                                                      | 60.5 mm                                                                                                      |

|                                                     | 6ES7 132-1BH00-0XB0                                                                                                      | 6ES7 132-1BL00-0XB0                                                                                                      |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                              |                                                                                                                          |                                                                                                                          |
| Rated value                                         |                                                                                                                          |                                                                                                                          |
| • 24 V DC                                           | Yes                                                                                                                      | Yes                                                                                                                      |
| • Reverse polarity protection                       | Yes                                                                                                                      | Yes                                                                                                                      |
| Mains buffering, min.                               | 20 ms                                                                                                                    | 20 ms                                                                                                                    |
| Load voltage 2L+                                    |                                                                                                                          |                                                                                                                          |
| • Rated value (DC)                                  | 24 V; 1L+, 2L+, 3L+                                                                                                      | 24 V; 1L+, 2L+, 3L+                                                                                                      |
| <b>Current consumption</b>                          |                                                                                                                          |                                                                                                                          |
| from load voltage L1 (without load), max.           | 50 mA; per load group (L1+ or L2+ / L3+)                                                                                 | 100 mA; per load group (L1+ or L2+ / L3+)                                                                                |
| from supply voltage L+, max.                        | 70 mA; L4+ / L5+                                                                                                         | 70 mA; L4+ / L5+                                                                                                         |
| <b>Power losses</b>                                 |                                                                                                                          |                                                                                                                          |
| Power loss, typ.                                    | 5 W                                                                                                                      | 7 W                                                                                                                      |
| <b>Hardware configuration</b>                       |                                                                                                                          |                                                                                                                          |
| Rack                                                |                                                                                                                          |                                                                                                                          |
| • Required terminal block                           | TB 16L                                                                                                                   | TB 32L                                                                                                                   |
| <b>Communication functions</b>                      |                                                                                                                          |                                                                                                                          |
| Bus protocol/transmission protocol                  | PROFIBUS DP                                                                                                              | PROFIBUS DP                                                                                                              |
| <b>Connection method</b>                            |                                                                                                                          |                                                                                                                          |
| Inputs/outputs                                      | Screw-type and spring-loaded terminals, permanent wiring; standard: 2-wire connection, optional: 3 and 4-wire connection | Screw-type and spring-loaded terminals, permanent wiring; standard: 2-wire connection, optional: 3 and 4-wire connection |
| <b>PROFIBUS DP</b>                                  |                                                                                                                          |                                                                                                                          |
| Transmission rate, max.                             | 1.5 Mbit/s                                                                                                               | 1.5 Mbit/s                                                                                                               |
| SYNC capability                                     | Yes                                                                                                                      | Yes                                                                                                                      |
| Direct data exchange (slave-to-slave communication) | Yes; Transmitter (for digital outputs and hybrid modules ET 200L: not for L-SC or IM-SC)                                 | Yes; Transmitter (for digital outputs and hybrid modules ET 200L: not for L-SC or IM-SC)                                 |

# SIMATIC ET 200 distributed I/O

## ET 200L

### ET 200L

#### Technical specifications (continued)

|                                                         | 6ES7 132-1BH00-0XB0                 | 6ES7 132-1BL00-0XB0                 |
|---------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Digital outputs</b>                                  |                                     |                                     |
| Number of digital outputs                               | 16                                  | 32                                  |
| Short-circuit protection                                | Yes; Electronic                     | Yes; Electronic                     |
| Response threshold, typ.                                | 0.7 A                               | 0.7 A                               |
| Limitation of inductive shutdown voltage to             | typ. (L1+ or L2+ / L3+) -55 V       | typ. (L1+ or L2+ / L3+) -55 V       |
| Lamp load, max.                                         | 5 W                                 | 5 W                                 |
| Controlling a digital input                             | Yes                                 | Yes                                 |
| Output voltage                                          |                                     |                                     |
| • rated value (DC)                                      | 24 V                                | 24 V                                |
| • for signal "1", min.                                  | Ua - 3 V                            | Ua - 3 V                            |
| Output current                                          |                                     |                                     |
| • for signal "1" rated value                            | 0.5 A                               | 0.5 A                               |
| • for signal "1" permissible range for 0 to 60 °C, max. | 0.5 A                               | 0.5 A                               |
| • for signal "0" residual current, max.                 | 1 mA                                | 1 mA                                |
| Output delay with resistive load                        |                                     |                                     |
| • 0 to "1", max.                                        | 50 ms                               | 50 ms                               |
| • 1 to "0", max.                                        | 200 ms                              | 200 ms                              |
| Parallel switching of 2 outputs                         |                                     |                                     |
| • for increased power                                   | No                                  | No                                  |
| • for redundant control of a load                       | Yes; only outputs of the same group | Yes; only outputs of the same group |
| Switching frequency                                     |                                     |                                     |
| • with resistive load, max.                             | 100 Hz                              | 100 Hz                              |
| • with inductive load, max.                             | 0.5 Hz                              | 0.5 Hz                              |
| • on lamp load, max.                                    | 8 Hz                                | 8 Hz                                |
| Aggregate current of outputs (per group)                |                                     |                                     |
| • all other mounting positions                          |                                     |                                     |
| - up to 40 °C, max.                                     | 2 A                                 | 2 A                                 |
| • up to 60 °C, max.                                     | 4 A                                 | 4 A                                 |
| • up to 40 °C, max.                                     | 3 000 mA                            | 3 000 mA                            |
| • horizontal arrangement, up to 60 °C, max.             | 2 000 mA                            | 2 000 mA                            |
| Load resistance range                                   |                                     |                                     |
| • lower limit                                           | 41 Ω                                | 41 Ω                                |
| • upper limit                                           | 28 000 Ω                            | 28 000 Ω                            |
| Cable length                                            |                                     |                                     |
| • Cable length, shielded, max.                          | 1 000 m                             | 1 000 m                             |
| • Cable length unshielded, max.                         | 600 m                               | 600 m                               |
| <b>Alarms/diagnostics/status information</b>            |                                     |                                     |
| Alarms                                                  |                                     |                                     |
| • Alarms                                                | No                                  | No                                  |
| Diagnostics                                             |                                     |                                     |
| • Diagnostic functions                                  | Yes                                 | Yes                                 |
| Diagnostic indication LED                               |                                     |                                     |
| • Bus fault BF (red)                                    | Yes                                 | Yes                                 |
| • Status indicator digital output (green)               | Yes                                 | Yes                                 |
| • Status indicator digital input (green)                | Yes                                 | Yes                                 |
| • Monitoring 24 V voltage supply ON (green)             | Yes                                 | Yes                                 |
| <b>Isolation</b>                                        |                                     |                                     |
| Isolation checked with                                  | 500 V DC                            | 500 V DC                            |
| <b>Galvanic isolation</b>                               |                                     |                                     |
| between PROFIBUS DP and all other circuit components    | Yes                                 | Yes                                 |

**Technical specifications (continued)**

|                                                 | 6ES7 132-1BH00-0XB0                                                                                          | 6ES7 132-1BL00-0XB0                                                                                          |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Galvanic isolation digital outputs              |                                                                                                              |                                                                                                              |
| • between the channels                          | No                                                                                                           | No                                                                                                           |
| • between the channels and PROFIBUS DP          | Yes; Optocoupler                                                                                             | Yes                                                                                                          |
| <b>Environmental requirements</b>               |                                                                                                              |                                                                                                              |
| Operating temperature                           |                                                                                                              |                                                                                                              |
| • Horizontal installation, min.                 | 0 °C                                                                                                         | 0 °C                                                                                                         |
| • Horizontal installation, max.                 | 60 °C; 40 °C for other mountings                                                                             | 60 °C; 40 °C for other mountings                                                                             |
| Air pressure                                    |                                                                                                              |                                                                                                              |
| • Permissible range, min.                       | 795 hPa                                                                                                      | 795 hPa                                                                                                      |
| • Permissible range, max.                       | 1 080 hPa                                                                                                    | 1 080 hPa                                                                                                    |
| Relative humidity                               |                                                                                                              |                                                                                                              |
| • Operation, min.                               | 5 %                                                                                                          | 5 %                                                                                                          |
| • Operation, max.                               | 95 %; RH class 2 in accordance with IEC 1131-2                                                               | 95 %; RH class 2 in accordance with IEC 1131-2                                                               |
| Vibrations                                      |                                                                                                              |                                                                                                              |
| • Operation, checked according to IEC 60068-2-6 | Yes; IEC 68, Part 2-6; 10 to 57 Hz; (constant amplitude 0.075 mm); 57 to 150 Hz; (constant acceleration 1 g) | Yes; IEC 68, Part 2-6; 10 to 57 Hz; (constant amplitude 0.075 mm); 57 to 150 Hz; (constant acceleration 1 g) |
| Shock test                                      |                                                                                                              |                                                                                                              |
| • checked according to IEC 60068-2-27           | Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms                                                               | Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms                                                               |
| <b>Degree of protection</b>                     |                                                                                                              |                                                                                                              |
| IP20                                            | Yes                                                                                                          | Yes                                                                                                          |
| <b>General information</b>                      |                                                                                                              |                                                                                                              |
| Vendor identification (VendorID)                | 0016h                                                                                                        | 0011h                                                                                                        |
| <b>Dimensions and weight</b>                    |                                                                                                              |                                                                                                              |
| Dimensions                                      |                                                                                                              |                                                                                                              |
| • Width                                         | 145 mm                                                                                                       | 145 mm                                                                                                       |
| • Height                                        | 60 mm                                                                                                        | 60 mm                                                                                                        |
| • Depth                                         | 60.5 mm                                                                                                      | 60.5 mm                                                                                                      |
| Weight                                          |                                                                                                              |                                                                                                              |
| • Weight, approx.                               | 130 g                                                                                                        | 150 g                                                                                                        |

|                                                     | 6ES7 133-1BL01-0XB0                                                                                                      |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                              |                                                                                                                          |
| Rated value                                         |                                                                                                                          |
| • 24 V DC                                           | Yes                                                                                                                      |
| • Reverse polarity protection                       | Yes                                                                                                                      |
| <b>Hardware configuration</b>                       |                                                                                                                          |
| Rack                                                |                                                                                                                          |
| • Required terminal block                           | TB 32L                                                                                                                   |
| <b>Connection method</b>                            |                                                                                                                          |
| Inputs/outputs                                      | Screw-type and spring-loaded terminals, permanent wiring; standard: 2-wire connection, optional: 3 and 4-wire connection |
| <b>PROFIBUS DP</b>                                  |                                                                                                                          |
| Transmission rate, max.                             | 1.5 Mbit/s                                                                                                               |
| Direct data exchange (slave-to-slave communication) | Yes; Transmitter (for digital outputs and hybrid modules ET 200L: not for L-SC or IM-SC)                                 |
| <b>Digital inputs</b>                               |                                                                                                                          |
| Number of digital inputs                            | 16                                                                                                                       |
| Input voltage                                       |                                                                                                                          |
| • rated value, DC                                   | 24 V                                                                                                                     |
| • for signal "0"                                    | -30 to +5 V                                                                                                              |
| • for signal "1"                                    | 13 to 30 V                                                                                                               |

|                                                         | 6ES7 133-1BL01-0XB0  |
|---------------------------------------------------------|----------------------|
| Input current                                           |                      |
| • for signal "1", typ.                                  | 5 mA                 |
| Input delay (for rated value of input voltage)          |                      |
| • for standard inputs                                   |                      |
| - at "0" to "1", min.                                   | 2 ms                 |
| - at "0" to "1", max.                                   | 4.5 ms               |
| Cable length                                            |                      |
| • Cable length for NAMUR input, shielded, max.          | 1 000 m              |
| <b>Digital outputs</b>                                  |                      |
| Number of digital outputs                               | 16                   |
| Short-circuit protection                                | Yes; Electronic      |
| Output voltage                                          |                      |
| • rated value (DC)                                      | 24 V                 |
| • for signal "1", min.                                  | U <sub>a</sub> - 3 V |
| Output current                                          |                      |
| • for signal "1" permissible range for 0 to 60 °C, max. | 0.5 mA               |
| • for signal "0" residual current, max.                 | 1 mA                 |
| Switching frequency                                     |                      |
| • with resistive load, max.                             | 100 Hz               |
| • with inductive load, max.                             | 0.5 Hz               |
| • on lamp load, max.                                    | 8 Hz                 |



# SIMATIC ET 200 distributed I/O

## ET 200L

### ET 200L

#### Technical specifications (continued)

| 6ES7 133-1BL01-0XB0                                  |                                          | 6ES7 133-1BL01-0XB0                             |                                                                                                              |
|------------------------------------------------------|------------------------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Aggregate current of outputs (per group)             | 4 A                                      | Relative humidity                               | 5 %<br>95 %; RH class 2 in accordance with IEC 1131-2                                                        |
| • up to 60 °C, max.                                  |                                          | • Operation, min.                               |                                                                                                              |
| Cable length                                         | 1 000 m                                  | • Operation, max.                               |                                                                                                              |
| • Cable length, shielded, max.                       |                                          | Vibrations                                      | Yes; IEC 68, Part 2-6; 10 to 57 Hz; (constant amplitude 0.075 mm); 57 to 150 Hz; (constant acceleration 1 g) |
| <b>Galvanic isolation</b>                            | Yes                                      | • Operation, checked according to IEC 60068-2-6 |                                                                                                              |
| between PROFIBUS DP and all other circuit components |                                          | Shock test                                      | Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms                                                               |
| Galvanic isolation digital inputs                    | No<br>Yes                                | • checked according to IEC 60068-2-27           |                                                                                                              |
| • between the channels                               |                                          | <b>Degree of protection</b>                     | Yes                                                                                                          |
| • between the channels and PROFIBUS DP               |                                          | IP20                                            |                                                                                                              |
| <b>Environmental requirements</b>                    | 0 °C<br>60 °C; 40 °C for other mountings | <b>Dimensions and weight</b>                    | 145 mm<br>60 mm<br>60.5 mm                                                                                   |
| Operating temperature                                |                                          | Dimensions                                      |                                                                                                              |
| • horizontal installation, min.                      | 0 °C<br>60 °C; 40 °C for other mountings | • Width                                         |                                                                                                              |
| • horizontal installation, max.                      |                                          | • Height                                        |                                                                                                              |
| Air pressure                                         | 795 hPa<br>1 080 hPa                     | • Depth                                         |                                                                                                              |
| • permissible range, min.                            |                                          |                                                 |                                                                                                              |
| • permissible range, max.                            |                                          |                                                 |                                                                                                              |

|                              | 6ES7 193-1CH00-0XA0                                                                                             | 6ES7 193-1CH10-0XA0                                                                                             | 6ES7 193-1CH20-0XA0                                                               | 6ES7 193-1CL00-0XA0                                                                                             | 6ES7 193-1CL10-0XA0                                                                                             |
|------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <b>Dimensions and weight</b> |                                                                                                                 |                                                                                                                 |                                                                                   |                                                                                                                 |                                                                                                                 |
| Dimensions                   |                                                                                                                 |                                                                                                                 |                                                                                   |                                                                                                                 |                                                                                                                 |
| • Width                      | 145 mm                                                                                                          | 145 mm                                                                                                          | 191 mm                                                                            | 191 mm                                                                                                          | 191 mm                                                                                                          |
| • Height                     | 100 mm; Height with electronics block from top edge of DIN rail (with bus connector 6ES7 972-0CA30-0XA0): 82 mm | 100 mm; Height with electronics block from top edge of DIN rail (with bus connector 6ES7 972-0CA30-0XA0): 82 mm | 100 mm; Height with electronics block from top edge (with bus connector): 98.5 mm | 100 mm; Height with electronics block from top edge of DIN rail (with bus connector 6ES7 972-0CA30-0XA0): 82 mm | 100 mm; Height with electronics block from top edge of DIN rail (with bus connector 6ES7 972-0CA30-0XA0): 82 mm |
| • Depth                      | 40.5 mm                                                                                                         | 40.5 mm                                                                                                         | 40.5 mm                                                                           | 40.5 mm                                                                                                         | 40.5 mm                                                                                                         |
| Weight                       |                                                                                                                 |                                                                                                                 |                                                                                   |                                                                                                                 |                                                                                                                 |
| • Weight, approx.            | 230 g                                                                                                           | 230 g                                                                                                           | 283 g                                                                             | 350 g                                                                                                           | 350 g                                                                                                           |

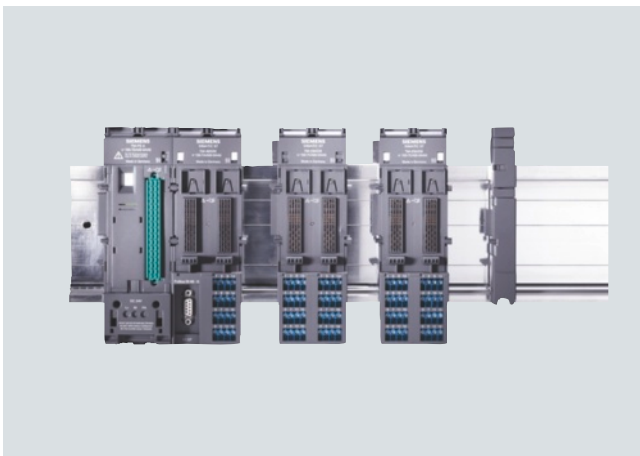
| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Order No.                                                                                                                                                                                                                                                | Order No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Electronic block for ET 200L</b><br>with digital inputs/outputs for 24 V DC <ul style="list-style-type: none"> <li>• 16 DI</li> <li>• 32 DI</li> <li>• 16 DO; 0.5 A</li> <li>• 32 DO; 0.5 A</li> <li>• 16 DI/16 DO; 0.5 A</li> </ul>                                                                                                                                                                                                                                                                                                                                                | <b>6ES7 131-1BH01-0XB0</b><br><b>6ES7 131-1BL01-0XB0</b><br><b>6ES7 132-1BH00-0XB0</b><br><b>6ES7 132-1BL00-0XB0</b><br><b>6ES7 133-1BL01-0XB0</b>                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Terminal block for ET 200L and ET 200L-SC</b><br>for mounting the electronic blocks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>TB 16L</b><br><ul style="list-style-type: none"> <li>• 16 channels, screw-type terminals</li> <li>• 16 channels, spring-loaded terminals</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>6ES7 193-1CH00-0XA0</b><br><b>6ES7 193-1CH10-0XA0</b>                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>TB 32L</b><br><ul style="list-style-type: none"> <li>• 32 channels, screw-type terminals</li> <li>• 32 channels, spring-loaded terminals</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>6ES7 193-1CL00-0XA0</b><br><b>6ES7 193-1CL10-0XA0</b>                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Add-on terminal for ET 200L and ET 200L-SC</b><br>16 channels; 1 tier <ul style="list-style-type: none"> <li>• Screw-type terminals</li> <li>• Spring-loaded terminals</li> </ul> 16 channels; 2 tiers <ul style="list-style-type: none"> <li>• Screw-type terminals</li> <li>• Spring-loaded terminals</li> </ul> 32 channels; 1 tier <ul style="list-style-type: none"> <li>• Screw-type terminals</li> <li>• Spring-loaded terminals</li> </ul> 32 channels; 2 tiers <ul style="list-style-type: none"> <li>• Screw-type terminals</li> <li>• Spring-loaded terminals</li> </ul> | <b>6ES7 193-1FH20-0XA0</b><br><b>6ES7 193-1FH50-0XA0</b><br><br><b>6ES7 193-1FH30-0XA0</b><br><b>6ES7 193-1FH60-0XA0</b><br><br><b>6ES7 193-1FL20-0XA0</b><br><b>6ES7 193-1FL50-0XA0</b><br><br><b>6ES7 193-1FL30-0XA0</b><br><b>6ES7 193-1FL60-0XA0</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                          | <b>Accessories</b><br><b>Labeling sheet with strips for 10 electronic blocks for</b> <ul style="list-style-type: none"> <li>• 16-channel electronic blocks incl. add-on terminals</li> <li>• 32-channel electronic blocks incl. add-on terminals</li> </ul> <b>PROFIBUS bus connector</b> <ul style="list-style-type: none"> <li>• 90° cable outlet, FastConnect terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 1 unit</li> <li>• 90° cable outlet, FastConnect terminating resistor with isolating function, without PG socket, up to 12 Mbit/s 100 units</li> <li>• Angular outgoing cable, insulation displacement terminals, without bus terminating resistor, without PG connection socket, up to 1.5 Mbit/s</li> <li>• 90° cable outlet, FastConnect terminating resistor with isolating function, with PG socket, up to 12 Mbit/s 1 unit</li> <li>• 90° cable outlet, FastConnect terminating resistor with isolating function, with PG socket, up to 12 Mbit/s 100 units</li> </ul> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                          | <b>6ES7 193-1BH00-0XA0</b><br><b>6ES7 193-1BL00-0XA0</b><br><br><b>6ES7 972-0BA52-0XA0</b><br><br><b>6ES7 972-0BA52-0XB0</b><br><br><b>6ES7 972-0BA30-0XA0</b><br><br><b>6ES7 972-0BB52-0XA0</b><br><br><b>6ES7 972-0BB52-0XB0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Introduction

### Overview



- Fail-safe distributed I/O system to IP30 degree of protection for use in hazardous gaseous and dusty areas, i.e. in Zones 1 and 2 as well as 21 and 22
- Sensors and actuators can also be situated directly in Zone 0 or 20.
- Individual configuration and flexible expansion with the modular design for optimization to the respective automation task
- Independent wiring enables prewiring without the electronics connected
- Optimized for integration into process control systems (e.g. SIMATIC PCS 7)
- Parameters can be assigned using SIMATIC PDM
- Optimal integration of HART field devices (HART transparency)
- Fail-safe digital inputs and outputs as well as analog inputs for the safety-related signal processing according to PROFIsafe
- Connection to PROFIBUS DP via isolating transformers
- Module replacement (hot swapping) and configuration expansion (Configuration in Run) possible during operation
- Extensive diagnostic possibilities
- Condensation-proof modules in temperature range -20°C to +70°C
- EMC in accordance with NE 21 (on Namur recommendation)
- Full redundancy of PROFIBUS and power supply

**Technical specifications****General**

|                      |                                                                                                           |
|----------------------|-----------------------------------------------------------------------------------------------------------|
| Degree of protection | IP30                                                                                                      |
| Ambient temperature  | -20°C ... +70°C                                                                                           |
| Medial load          | In accordance with ISA-S71.04 severity level G1 ;G2 ;G3<br>(with the exception of NH3 here only Level G2) |
| EMC                  | Electromagnetic compatibility in accordance with NE21                                                     |
| Vibration-proof      | 0.5 g permanently, 1 g periodically                                                                       |

**Approvals, standards**

|                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• ATEX</li> </ul>                                                                   | II 2 G (1) GD<br>I M2<br>Zone 1<br>Zone 1<br>Class I,II,II                                                                                                                                                                                                                                                                                                                                                                               | Ex de [ia/ib] IIC T4<br>Ex de [ia/ib] I<br>Ex de [ia/ib] IIC T4<br>BR-Ex de [ia/ib] IIC T4<br>NI Division 2, Groups A, B, C, D, E, F, G T4<br>AIS Division 1, Groups A, B, C, D, E, F, G |
| <ul style="list-style-type: none"> <li>• IECEX</li> <li>• INMETRO</li> <li>• cFMus</li> </ul>                              | Class I<br>Class I,II,II                                                                                                                                                                                                                                                                                                                                                                                                                 | Zone 1, AEx de [ia/ib] IIC T4<br>Division 2, Groups A, B, C, D, E, F, G T4<br>providing int. safe circuits for Division<br>1, Groups A, B, C, D, E, F, G                                 |
| <ul style="list-style-type: none"> <li>• cULus</li> </ul>                                                                  | Class I<br>Class I,II,II                                                                                                                                                                                                                                                                                                                                                                                                                 | Zone 1, AEx de [ia/ib] IIC T4                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• PROFIBUS</li> <li>• IEC</li> <li>• CE</li> <li>• Shipbuilding approval</li> </ul> | Class I<br>EN 50170, Volume 2<br>IEC 61131, Part 2<br>In accordance with 94/9/EG (ATEX 100a), 89/336/EEC and 73/23/EEC<br>Classification companies<br><ul style="list-style-type: none"> <li>• ABS (American Bureau of Shipping)</li> <li>• BV (Bureau Veritas)</li> <li>• DNV (Det Norske Veritas)</li> <li>• GL (Germanischer Lloyd)</li> <li>• LRS (Lloyds Register of Shipping)</li> <li>• Class NK (Nippon Kaiji Kyokai)</li> </ul> |                                                                                                                                                                                          |

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### IM 152-1 interface module

#### Overview



- The IM 152 interface module is plugged onto the corresponding terminal module TM-IM/EM (to be ordered separately). For redundant operation, two IM 152 are used. They are plugged onto the TM-IM/IM.
- The interface module IM 152 has the following properties:
  - Connects the ET 200iSP to PROFIBUS DP
  - Prepares data for the fitted electronic modules
  - The PROFIBUS address of ET 200iSP can be adjusted by switch
  - Slot for MMC
  - Firmware updating over PROFIBUS DP or MMC
- Shutting down the 24 V DC supply voltage at the terminal module TM-PS also shuts down the interface module IM 152.
- The maximum address size is 244 byte inputs and 244 byte outputs.

#### Technical specifications

| 6ES7 152-1AA00-0AB0                                 |                                                             |
|-----------------------------------------------------|-------------------------------------------------------------|
| <b>Supply voltages</b>                              |                                                             |
| Mains buffering, min.                               | f                                                           |
| <b>Current consumption</b>                          |                                                             |
| from supply voltage 1L+, max.                       | 30 mA                                                       |
| <b>Current consumption/ power loss</b>              |                                                             |
| Power loss, typ.                                    | 0.5 W                                                       |
| <b>Interfaces</b>                                   |                                                             |
| Interface physics, RS 485                           | Yes; (intrinsically safe)                                   |
| <b>Protocols</b>                                    |                                                             |
| PROFIBUS DP protocol                                | Yes                                                         |
| <b>PROFIBUS DP</b>                                  |                                                             |
| Transmission rate, max.                             | 1.5 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s |
| SYNC capability                                     | Yes                                                         |
| FREECE capability                                   | Yes                                                         |
| Direct data exchange (slave-to-slave communication) | Yes; Slave to slave as publisher                            |
| <b>Isochronous mode</b>                             |                                                             |
| Isochronous mode                                    | No                                                          |
| <b>Alarms/diagnostics/status information</b>        |                                                             |
| Alarms                                              |                                                             |
| • Alarms                                            | Yes                                                         |
| • Acyclic function, interrupts                      | Yes                                                         |
| • Acyclic function, parameters                      | Yes                                                         |
| Diagnostics                                         |                                                             |
| • Diagnostic functions                              | Yes                                                         |
| Diagnostic indication LED                           |                                                             |
| • Bus fault BF (red)                                | Yes                                                         |
| • Group error SF (red)                              | Yes                                                         |
| • Monitoring 24 V voltage supply ON (green)         | Yes                                                         |

| 6ES7 152-1AA00-0AB0                                                       |                                                              |
|---------------------------------------------------------------------------|--------------------------------------------------------------|
| <b>Time stamping</b>                                                      |                                                              |
| Description                                                               | for each digital input, digital input module, total ET 200iS |
| Accuracy                                                                  | 20 ms                                                        |
| Number of stampable digital inputs, max.                                  | 64; for accuracy class 20 ms                                 |
| Time format                                                               | RFC 1119 Internet (ISP)                                      |
| Time resolution                                                           | 1 ms                                                         |
| Time interval for transmitting the message buffer if a message is present | 1 000 ms                                                     |
| Time stamp on signal change                                               | rising / falling edge as signal entering or exiting          |
| <b>Galvanic isolation</b>                                                 |                                                              |
| between supply voltage and electronics                                    | Yes                                                          |
| <b>Standards, approvals, certificates</b>                                 |                                                              |
| CE mark                                                                   | Yes                                                          |
| Type of protection acc. to EN 50020 (CENELEC)                             | II2 G Ex ib IIC T4 and I M2 Ex ib I                          |
| Type of protection acc. to KEMA                                           | 04 ATEX 1243                                                 |
| <b>General information</b>                                                |                                                              |
| Vendor identification (VendorID)                                          | 8110H                                                        |
| <b>Dimensions and weight</b>                                              |                                                              |
| Dimensions and weight                                                     |                                                              |
| • Width                                                                   | 30 mm                                                        |
| • Height                                                                  | 129 mm                                                       |
| • Depth                                                                   | 136.5 mm                                                     |
| Weight                                                                    |                                                              |
| • Weight, approx.                                                         | 245 g                                                        |

### Technical specifications (continued)

|                                               | 6ES7 193-7AA00-0AA0 | 6ES7 193-7AA10-0AA0 | 6ES7 193-7AB00-0AA0 |
|-----------------------------------------------|---------------------|---------------------|---------------------|
| <b>Standards, approvals, certificates</b>     |                     |                     |                     |
| CE mark                                       | No                  | No                  | No                  |
| Type of protection acc. to EN 50020 (CENELEC) | No                  | No                  | No                  |
| Test number KEMA                              | 04 ATEX 2242        | 04 ATEX 2242        | 04 ATEX 2242        |
| <b>Dimensions and weight</b>                  |                     |                     |                     |
| Dimensions and weight                         |                     |                     |                     |
| • Width                                       | 60 mm               | 60 mm               | 60 mm               |
| • Height                                      | 190 mm              | 190 mm              | 190 mm              |
| • Depth                                       | 52 mm               | 52 mm               | 52 mm               |
| Weight                                        |                     |                     |                     |
| • Weight, approx.                             | 235 g               | 235 g               | 195 g               |

| Ordering data                                                                                                                                                                                       | Order No.                                                                                                            | Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Order No.                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>IM 152</b><br>• ET 200iSP-IM 152-1                                                                                                                                                               | <b>6ES7 152-1AA00-0AB0</b>                                                                                           | <b>Labels, blank</b><br>Ordering unit: 1 set with 200 units each for slot numbering                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>8WA8 848-2AY</b>                                                                                          |
| <b>Terminal module for IM 152 incl. termination module</b><br>• TM-IM/EM60S<br>• TM-IM/EM60C<br>• TM-IM/IM                                                                                          | <b>6ES7 193-7AA00-0AA0</b><br><b>6ES7 193-7AA10-0AA0</b><br><b>6ES7 193-7AB00-0AA0</b>                               | <b>S7-300 mounting rails</b><br>Standard rail 585 mm<br>Standard rail 885 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>6ES7 390-1AF85-0AA0</b><br><b>6ES7 390-1AJ85-0AA0</b>                                                     |
| <b>Accessories</b>                                                                                                                                                                                  |                                                                                                                      | <b>Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e</b><br>Empty enclosure without installation of modules, for use in a gaseous area, IP65 (IP54 when using a breather gland)<br>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs<br>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (66 units)<br>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs<br>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (111 units) | <b>6DL2 804-0AD30</b><br><br><b>6DL2 804-0AD50</b><br><br><b>6DL2 804-0AE30</b><br><br><b>6DL2 804-0AE50</b> |
| <b>ET 200iSP manual</b><br>• German<br>• English                                                                                                                                                    | <b>6ES7 152-1AA00-8AA0</b><br><b>6ES7 152-1AA00-8BA0</b>                                                             | Empty enclosure without installation of modules, for use in a dusty area, IP65<br>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>6DL2 804-0DD30</b>                                                                                        |
| <b>Connectors</b><br>PROFIBUS connector with active terminating resistor<br>for RS 485-IS circuit; 1.5 Mbit/s                                                                                       | <b>6ES7 972-0DA60-0XA0</b>                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                              |
| <b>RS 485-IS coupler</b><br>Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS                                                                                                | <b>6ES7 972-0AC80-0XA0</b>                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                              |
| <b>Labeling sheet</b><br>DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules, and 20 strips each for IM 152<br>• petrol<br>• red<br>• yellow<br>• light beige | <b>6ES7 193-7BH00-0AA0</b><br><b>6ES7 193-7BD00-0AA0</b><br><b>6ES7 193-7BB00-0AA0</b><br><b>6ES7 193-7BA00-0AA0</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                              |
| <b>Labels, inscribed</b><br>Ordering unit: 1 set with 200 units each for slot numbering<br>• 10 x slots 1 to 2<br>• 5 x slots 1 to 40<br>• 1 x slot 1 to 64<br>2 x slots 1 to 68                    | <b>8WA8 861-0AB</b><br><b>8WA8 861-0AC</b><br><b>8WA8 861-0DA</b>                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                              |

I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### IM 152-1 interface module

#### Ordering data

#### Order No.

#### Order No.

Empty enclosure without installation of modules, for use in a dusty area, IP65

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (111 units)

**6DL2 804-0DD50**

**6DL2 804-0DE30**

**6DL2 804-0DE50**

Enclosure with installation of ET 200iSP modules for use in a gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs

**6DL2 804-1AD30**

**6DL2 804-1AD50**

**6DL2 804-1AE30**

Enclosure with installation of ET 200iSP modules for use in a gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately

- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (111 units)

**6DL2 804-1AE50**

Enclosure with installation of modules, for use in a dusty area, IP65; the ET 200iSP components must be ordered separately

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (111 units)

**6DL2 804-1DD30**

**6DL2 804-1DD50**

**6DL2 804-1DE30**

**6DL2 804-1DE50**

I: Subject to export regulations AL: N and ECCN: EAR99H

### Overview



The power supply (PS) is plugged into the associated terminal module TM-PS-A or TM-PS-B (with redundancy; to be ordered separately).

The power supply unit fulfills the following functions:

- It provides reliable isolated power supply for the ET 200iSP with the necessary operating voltages for
  - logic (through the backplane bus)
  - PROFIBUS DP interface of IM 152-1
  - power bus (for supplying the electronic modules)
- Takes over the safety limit of the output voltage
- Has an explosion-proof metal enclosure (explosion protection EEx d)
- Can be redundantly configured

### Technical specifications

|                                              | 6ES7 138-7EA01-0AA0 | 6ES7 138-7EC00-0AA0                                                     |
|----------------------------------------------|---------------------|-------------------------------------------------------------------------|
| <b>Supply voltages</b>                       |                     |                                                                         |
| Load voltage L+                              |                     |                                                                         |
| • Rated value (DC)                           | 24 V                |                                                                         |
| • Reverse polarity protection                | Yes                 |                                                                         |
| Load voltage L1                              |                     |                                                                         |
| • Rated value (AC)                           |                     | 230 V; 120/230 V AC                                                     |
| • Permissible range, lower limit (AC)        |                     | 85 V                                                                    |
| • Permissible range, upper limit (AC)        |                     | 264 V                                                                   |
| • Permissible frequency range, lower limit   |                     | 47 Hz                                                                   |
| • Permissible frequency range, upper limit   |                     | 63 Hz                                                                   |
| <b>Current consumption</b>                   |                     |                                                                         |
| from supply voltage L+, max.                 | 4 A                 |                                                                         |
| from supply voltage L1, max.                 |                     | 1.04 A; at rated voltage 230 V AC:0.45A at rated voltage 120 V AC:0.75A |
| <b>Power losses</b>                          |                     |                                                                         |
| Power loss, typ.                             | 20 W                | 5 W; 5W + 1.2 x total power losses of the electronic modules            |
| Power loss, max.                             |                     | 21.3 W                                                                  |
| <b>Ex(i) characteristics</b>                 |                     |                                                                         |
| Max. values of input circuits (per channel)  |                     |                                                                         |
| • Um (fault voltage), max.                   | 250 V; DC           | 264 V; AC/DC                                                            |
| <b>Alarms/diagnostics/status information</b> |                     |                                                                         |
| Status indicator                             | Yes                 | Yes                                                                     |
| Alarms                                       |                     |                                                                         |
| • Alarms                                     | No                  | No                                                                      |
| Diagnostics                                  |                     |                                                                         |
| • Diagnostic information readable            | Yes; via IM 152     | Yes; via IM 152                                                         |
| Diagnostic indication LED                    |                     |                                                                         |
| • Group error SF (red)                       | No                  | No                                                                      |
| <b>Galvanic isolation</b>                    |                     |                                                                         |
| primary/secondary                            | Yes                 | Yes                                                                     |
| between supply voltage and electronics       | Yes                 | No                                                                      |



# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Power supply units

#### Technical specifications (continued)

|                                               | 6ES7 138-7EA01-0AA0 | 6ES7 138-7EC00-0AA0 |
|-----------------------------------------------|---------------------|---------------------|
| <b>Standards, approvals, certificates</b>     |                     |                     |
| CE mark                                       | Yes                 | Yes                 |
| Type of protection acc. to EN 50020 (CENELEC) | Ex de [ib] IIC T4   | Ex de [ib] IIC T4   |
| Type of protection acc. to KEMA               | 04 ATEX 2263        | 09 ATEX 0156        |
| <b>Dimensions and weight</b>                  |                     |                     |
| Dimensions                                    |                     |                     |
| • Width                                       | 60 mm               | 60 mm               |
| • Height                                      | 190 mm              | 190 mm              |
| • Depth                                       | 136.5 mm            | 136.5 mm            |
| Weight                                        |                     |                     |
| • Weight, approx.                             | 2 700 g             | 2 700 g             |

|                                               | 6ES7 193-7DA10-0AA0 | 6ES7 193-7DB10-0AA0 | 6ES7 193-7DA20-0AA0                                        | 6ES7 193-7DB20-0AA0                                        |
|-----------------------------------------------|---------------------|---------------------|------------------------------------------------------------|------------------------------------------------------------|
| <b>Standards, approvals, certificates</b>     |                     |                     |                                                            |                                                            |
| CE mark                                       |                     |                     | Yes                                                        | Yes                                                        |
| Type of protection acc. to EN 50020 (CENELEC) |                     |                     | II 2 G (1) GD and I M2 Ex e [ia/ib] IIC T4; Ex e [ia/ib] I | II 2 G (1) GD and I M2 Ex e [ia/ib] IIC T4; Ex e [ia/ib] I |
| Test number KEMA                              |                     |                     | 04 ATEX 2242                                               | 04 ATEX 2242                                               |
| <b>Dimensions and weight</b>                  |                     |                     |                                                            |                                                            |
| Dimensions and weight                         |                     |                     |                                                            |                                                            |
| • Width                                       | 60 mm               | 60 mm               | 60 mm                                                      | 60 mm                                                      |
| • Height                                      | 190 mm              | 190 mm              | 190 mm                                                     | 190 mm                                                     |
| • Depth                                       | 52 mm               | 52 mm               | 52 mm                                                      | 52 mm                                                      |
| Weight                                        |                     |                     |                                                            |                                                            |
| • Weight, approx.                             |                     |                     | 230 g                                                      | 230 g                                                      |

| Ordering data                                   | Order No.           | Ordering data                                      | Order No.           |
|-------------------------------------------------|---------------------|----------------------------------------------------|---------------------|
| PS 24 V DC power supply module                  | 6ES7 138-7EA01-0AA0 | PS 120/230 V AC power supply module                | 6ES7 138-7EC00-0AA0 |
| TM-PS-A Standard terminal module                | 6ES7 193-7DA10-0AA0 | TM-PS-A UC Standard terminal module                | 6ES7 193-7DA20-0AA0 |
| TM-PS-B terminal module for redundant operation | 6ES7 193-7DB10-0AA0 | TM-PS-B UC terminal module for redundant operation | 6ES7 193-7DB20-0AA0 |

I: Subject to export regulations AL: N and ECCN: EAR99H

### Overview



- The electronic modules are plugged into the associated terminal modules that must be ordered separately (with screw-type or spring-loaded terminals).
- When plugged in, the modules are automatically uniquely coded mechanically.
- Modules can be replaced under potentially explosive conditions during runtime.

### Technical specifications

| 6ES7 131-7RF00-0AB0                            |                                                                                                                      |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                         |                                                                                                                      |
| Rated value                                    | 20.4 V                                                                                                               |
| • permissible range, lower limit (DC)          | 28.8 V                                                                                                               |
| • permissible range, upper limit (DC)          |                                                                                                                      |
| <b>Digital inputs</b>                          |                                                                                                                      |
| Number of inputs                               | 8                                                                                                                    |
| Number of NAMUR inputs                         | 8                                                                                                                    |
| Input delay (for rated value of input voltage) |                                                                                                                      |
| • for standard inputs                          |                                                                                                                      |
| - at "0" to "1", min.                          | 2.8 µs                                                                                                               |
| - at "0" to "1", max.                          | 3.5 µs                                                                                                               |
| - at "1" to "0", min.                          | 2.8 ms                                                                                                               |
| - at "1" to "0", max.                          | 3.5 µs                                                                                                               |
| Cable length                                   |                                                                                                                      |
| • Cable length, shielded, max.                 | 500 m                                                                                                                |
| <b>Encoder</b>                                 |                                                                                                                      |
| Number of connectable encoders, max.           | 8                                                                                                                    |
| Connectable encoders                           |                                                                                                                      |
| • NAMUR encoder                                | Yes                                                                                                                  |
| NAMUR encoder                                  |                                                                                                                      |
| • Input current, for signal "0", max.          | 1.2 mA                                                                                                               |
| • Input current, for signal "1", min.          | 2.1 mA                                                                                                               |
| <b>Integrated Functions</b>                    |                                                                                                                      |
| Frequency meter                                | Yes                                                                                                                  |
| Frequency measurement                          | Yes; (Gate time) 50 ms; 200 ms; 1 s                                                                                  |
| Number of frequency meters                     | 2                                                                                                                    |
| <b>Counter</b>                                 |                                                                                                                      |
| Number of counter inputs                       | 2; normal and periodic count function                                                                                |
| Input frequency, max.                          | 5 kHz; with a cable length of 20 m: 5 kHz; with a cable length of 100 m: 1 kHz; with a cable length of 200 m: 500 Hz |

| 6ES7 131-7RF00-0AB0                           |                                                                                                 |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Alarms/diagnostics/status information</b>  |                                                                                                 |
| Alarms                                        |                                                                                                 |
| • Diagnostic alarm                            | Yes; Parameterizable                                                                            |
| • Process alarm                               | No                                                                                              |
| Diagnostics                                   |                                                                                                 |
| • Diagnostic functions                        | Yes                                                                                             |
| • Diagnostic information readable             | Yes                                                                                             |
| • Short circuit                               | Yes; R load < 150 Ohm with NAMUR sensor/sensor and NAMUR changeover contact/sensor to DIN 19234 |
| diagnostic indication LED                     |                                                                                                 |
| • Group error SF (red)                        | Yes                                                                                             |
| <b>Galvanic isolation</b>                     |                                                                                                 |
| Galvanic isolation digital inputs             |                                                                                                 |
| • between the channels                        | No                                                                                              |
| • between the channels and the backplane bus  | Yes                                                                                             |
| <b>Permissible potential difference</b>       |                                                                                                 |
| between different circuits                    | 60 V DC / 30 V AC                                                                               |
| <b>Standards, approvals, certificates</b>     |                                                                                                 |
| CE mark                                       | Yes                                                                                             |
| Type of protection acc. to EN 50020 (CENELEC) | II2 G (1) GD Ex ib[ja] IIC T4 and I M2 Ex ib[ja] I                                              |
| Type of protection acc. to KEMA               | 04 ATEX 1248                                                                                    |
| <b>Dimensions and weight</b>                  |                                                                                                 |
| Dimensions and weight                         |                                                                                                 |
| • Width                                       | 30 mm                                                                                           |
| • Height                                      | 129 mm                                                                                          |
| • Depth                                       | 136.5 mm                                                                                        |
| Weight                                        |                                                                                                 |
| • Weight, approx.                             | 255 g                                                                                           |

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Digital electronic modules

#### Technical specifications (continued)

|                                                           | 6ES7 132-7RD01-0AB0                                       | 6ES7 132-7RD11-0AB0                                       | 6ES7 132-7RD22-0AB0                                       |
|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|
| <b>Current consumption</b>                                |                                                           |                                                           |                                                           |
| from load voltage L+ (without load), max.                 | 340 mA; with actuator supply                              | 300 mA                                                    |                                                           |
| from backplane bus 3.3 V DC, max.                         | 10 mA                                                     | 10 mA                                                     |                                                           |
| <b>Power losses</b>                                       |                                                           |                                                           |                                                           |
| Power loss, typ.                                          | 2.5 W                                                     | 2.1 W                                                     | 2.8 W                                                     |
| <b>Address area</b>                                       |                                                           |                                                           |                                                           |
| Address space per module                                  |                                                           |                                                           |                                                           |
| • without packing                                         | 2 byte                                                    | 2 byte                                                    | 2 byte                                                    |
| <b>Digital inputs</b>                                     |                                                           |                                                           |                                                           |
| Cable length                                              |                                                           |                                                           |                                                           |
| • Cable length, shielded, max.                            |                                                           |                                                           | 20 m                                                      |
| • Cable length unshielded, max.                           |                                                           |                                                           | 20 m                                                      |
| <b>Digital outputs</b>                                    |                                                           |                                                           |                                                           |
| Number of digital outputs                                 | 4; additionally 1 intrinsically-safe input for H shutdown | 4; additionally 1 intrinsically-safe input for H shutdown | 4; additionally 1 intrinsically-safe input for H shutdown |
| Short-circuit protection                                  | Yes; Ex i function                                        | Yes                                                       | Yes                                                       |
| No-load voltage U <sub>ao</sub> (DC)                      | 23.1 V                                                    | 17.4 V                                                    | 17.4 V                                                    |
| Internal resistor R <sub>i</sub>                          | 275 Ω                                                     | 150 Ω                                                     | 167 Ω                                                     |
| Trend key points E                                        |                                                           |                                                           |                                                           |
| • Voltage U <sub>e</sub> (DC)                             | 17.1 V                                                    | 13.2 V                                                    | 10.7 V                                                    |
| • Current I <sub>e</sub>                                  | 20 mA                                                     | 27 mA                                                     | 40 mA; 80 mA when outputs connected in parallel           |
| Output current                                            |                                                           |                                                           |                                                           |
| • for signal "1" rated value                              | 0.02 A                                                    | 0.03 A                                                    |                                                           |
| Output delay with resistive load                          |                                                           |                                                           |                                                           |
| • 0 to "1", max.                                          | 2 ms                                                      | 2 ms                                                      | 2 ms                                                      |
| • 1 to "0", max.                                          | 1.5 ms                                                    | 1.5 ms                                                    | 1.5 ms                                                    |
| Parallel switching of 2 outputs                           |                                                           |                                                           |                                                           |
| • for increased power                                     | No; for Ex reasons not possible; nor for predecessor      | Yes                                                       | Yes                                                       |
| Switching frequency                                       |                                                           |                                                           |                                                           |
| • with resistive load, max.                               | 100 Hz                                                    | 100 Hz                                                    | 100 Hz                                                    |
| • with inductive load, max.                               | 2 Hz                                                      | 2 Hz                                                      | 2 Hz                                                      |
| Cable length                                              |                                                           |                                                           |                                                           |
| • Cable length, shielded, max.                            | 500 m                                                     | 500 m                                                     | 500 m                                                     |
| • Cable length unshielded, max.                           | 500 m                                                     | 500 m                                                     | 500 m                                                     |
| <b>Ex(i) characteristics</b>                              |                                                           |                                                           |                                                           |
| Max. values of output circuits (per channel)              |                                                           |                                                           |                                                           |
| • C <sub>o</sub> (permissible external capacity), max.    |                                                           |                                                           | 241 nF; for IIC, 1507nF for IIB                           |
| • I <sub>o</sub> (short-circuit current), max.            |                                                           |                                                           | 118 mA                                                    |
| • L <sub>o</sub> (permissible external inductivity), max. |                                                           |                                                           | 1.7 mH; For IIC, 10.4 mH for IIB                          |
| • P <sub>o</sub> (power of load), max.                    |                                                           |                                                           | 572 mW                                                    |
| • U <sub>o</sub> (output no-load voltage), max.           |                                                           |                                                           | 19.4 V                                                    |
| • T <sub>a</sub> (permissible ambient temperature), max.  | 70 °C                                                     | 70 °C                                                     |                                                           |

## Technical specifications (continued)

|                                                  | 6ES7 132-7RD01-0AB0                                                          | 6ES7 132-7RD11-0AB0                                | 6ES7 132-7RD22-0AB0                                                         |
|--------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------|
| <b>Parameter</b>                                 |                                                                              |                                                    |                                                                             |
| Remark                                           |                                                                              | 14 byte                                            |                                                                             |
| Diagnostics: wire break                          | yes                                                                          | yes                                                | yes                                                                         |
| Diagnostics: short circuit                       | yes                                                                          | yes                                                | yes                                                                         |
| Behavior on CPU/Master STOP, channel-wise        | yes                                                                          | yes                                                | Substitute a value/keep last value                                          |
| <b>Interrupts/diagnostics/status information</b> |                                                                              |                                                    |                                                                             |
| Status indicator                                 |                                                                              |                                                    | Yes                                                                         |
| Substitute values connectable                    |                                                                              |                                                    | Yes                                                                         |
| Alarms                                           |                                                                              |                                                    |                                                                             |
| • Alarms                                         |                                                                              | No                                                 | No                                                                          |
| • Diagnostic alarm                               | Yes                                                                          | Yes                                                | Yes; parameterizable                                                        |
| Diagnostics                                      |                                                                              |                                                    |                                                                             |
| • Diagnostic functions                           | Yes                                                                          | Yes                                                | Yes                                                                         |
| • Diagnostic information readable                | Yes                                                                          | Yes                                                | Yes                                                                         |
| • Wire break                                     | Yes; R > 10 kOhm, I < 100 µA                                                 | Yes                                                | Yes; R > 10 kOhm, I < 100 µA                                                |
| • Short circuit                                  | Yes; R < 800 Ohm (one output),<br>R < 40 Ohm (outputs connected in parallel) | Yes                                                | Yes; R < 80 Ohm (one output),<br>R < 40 Ohm (outputs connected in parallel) |
| diagnostic indication LED                        |                                                                              |                                                    |                                                                             |
| • Group error SF (red)                           | Yes                                                                          | Yes                                                | Yes                                                                         |
| • Status indicator digital output (green)        | Yes                                                                          | Yes                                                | Yes; per channel                                                            |
| <b>Galvanic isolation</b>                        |                                                                              |                                                    |                                                                             |
| Galvanic isolation digital outputs               |                                                                              |                                                    |                                                                             |
| • between the channels                           |                                                                              |                                                    | No                                                                          |
| • between the channels and the backplane bus     |                                                                              |                                                    | Yes                                                                         |
| • between the channels and the load voltage L+   |                                                                              |                                                    | Yes                                                                         |
| <b>Permissible potential difference</b>          |                                                                              |                                                    |                                                                             |
| between different circuits                       |                                                                              |                                                    | 60 V DC/30 V AC                                                             |
| <b>Standards, approvals, certificates</b>        |                                                                              |                                                    |                                                                             |
| CE mark                                          | Yes                                                                          | Yes                                                | Yes                                                                         |
| Type of protection acc. to EN 50020 (CENELEC)    | II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I                           | II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I |                                                                             |
| Type of protection acc. to KEMA                  | not relevant                                                                 | not relevant                                       | 04 ATEX 1249                                                                |
| <b>Dimensions and weight</b>                     |                                                                              |                                                    |                                                                             |
| Dimensions                                       |                                                                              |                                                    |                                                                             |
| • Width                                          | 30 mm                                                                        | 30 mm                                              | 30 mm                                                                       |
| • Height                                         | 129 mm                                                                       | 129 mm                                             | 129 mm                                                                      |
| • Depth                                          | 136.5 mm                                                                     | 136.5 mm                                           | 136.5 mm                                                                    |
| Weight                                           |                                                                              |                                                    |                                                                             |
| • Weight, approx.                                | 255 g                                                                        | 255 g                                              | 255 g                                                                       |

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Digital electronic modules

#### Technical specifications (continued)

|                                                  | 6ES7 132-7GD00-0AB0                                       | 6ES7 132-7GD10-0AB0                                       | 6ES7 132-7GD21-0AB0                                       | 6ES7 132-7GD30-0AB0                                       |
|--------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|
| <b>Current consumption</b>                       |                                                           |                                                           |                                                           |                                                           |
| from load voltage L+ (without load), max.        | 340 mA; with actuator supply                              | 300 mA; with actuator supply                              | 400 mA                                                    | 400 mA                                                    |
| from backplane bus 3.3 V DC, max.                | 10 mA                                                     | 10 mA                                                     |                                                           |                                                           |
| <b>Power losses</b>                              |                                                           |                                                           |                                                           |                                                           |
| Power loss, typ.                                 | 2.5 W                                                     | 2.1 W                                                     | 2.8 W                                                     | 2.8 W                                                     |
| <b>Address area</b>                              |                                                           |                                                           |                                                           |                                                           |
| Address space per module                         |                                                           |                                                           |                                                           |                                                           |
| • without packing                                | 2 byte                                                    | 2 byte                                                    | 2 byte                                                    | 2 byte                                                    |
| <b>Digital inputs</b>                            |                                                           |                                                           |                                                           |                                                           |
| Cable length                                     |                                                           |                                                           |                                                           |                                                           |
| • Cable length, shielded, max.                   |                                                           |                                                           | 20 m                                                      | 20 m                                                      |
| • Cable length unshielded, max.                  |                                                           |                                                           | 20 m                                                      | 20 m                                                      |
| <b>Digital outputs</b>                           |                                                           |                                                           |                                                           |                                                           |
| Number of digital outputs                        | 4; additionally 1 intrinsically-safe input for L shutdown | 4; additionally 1 intrinsically-safe input for L shutdown | 4; additionally 1 intrinsically-safe input for L shutdown | 4; additionally 1 intrinsically-safe input for L shutdown |
| Short-circuit protection                         | Yes; Ex i function                                        | Yes; Ex i function                                        | Yes                                                       | Yes                                                       |
| No-load voltage $U_{ao}$ (DC)                    | 23.1 V                                                    | 17.4 V                                                    | 17.4 V                                                    | 25.5 V                                                    |
| Internal resistor $R_i$                          |                                                           | 150 $\Omega$                                              | 167 $\Omega$                                              | 260 $\Omega$                                              |
| Trend key points E                               |                                                           |                                                           |                                                           |                                                           |
| • Voltage $U_e$ (DC)                             | 17.1 V                                                    | 13.2 V                                                    | 10.7 V                                                    | 19.8 V                                                    |
| • Current $I_e$                                  | 20 mA                                                     | 27 mA; 54 mA when outputs connected in parallel           | 40 mA                                                     | 22 mA                                                     |
| <b>Output current</b>                            |                                                           |                                                           |                                                           |                                                           |
| • for signal "1" rated value                     | 0.02 A                                                    | 0.02 A                                                    |                                                           |                                                           |
| <b>Output delay with resistive load</b>          |                                                           |                                                           |                                                           |                                                           |
| • 0 to "1", max.                                 | 2 ms                                                      | 2 ms                                                      | 2 ms                                                      | 2 ms                                                      |
| • 1 to "0", max.                                 | 1.5 ms                                                    | 1.5 ms                                                    | 1.5 ms                                                    | 1.5 ms                                                    |
| <b>Parallel switching of 2 outputs</b>           |                                                           |                                                           |                                                           |                                                           |
| • for increased power                            | No; for Ex reasons not possible; nor for predecessor      | Yes                                                       | Yes                                                       | No                                                        |
| <b>Switching frequency</b>                       |                                                           |                                                           |                                                           |                                                           |
| • with resistive load, max.                      | 100 Hz                                                    | 100 Hz                                                    | 100 Hz                                                    | 100 Hz                                                    |
| • with inductive load, max.                      | 2 Hz                                                      | 2 Hz                                                      | 2 Hz                                                      | 2 Hz                                                      |
| <b>Cable length</b>                              |                                                           |                                                           |                                                           |                                                           |
| • Cable length, shielded, max.                   | 500 m                                                     | 500 m                                                     | 500 m                                                     | 500 m                                                     |
| • Cable length unshielded, max.                  | 500 m                                                     | 500 m                                                     | 500 m                                                     | 500 m                                                     |
| <b>Ex(i) characteristics</b>                     |                                                           |                                                           |                                                           |                                                           |
| Max. values of output circuits (per channel)     |                                                           |                                                           |                                                           |                                                           |
| • $C_o$ (permissible external capacity), max.    |                                                           |                                                           | 241 nF; for IIC, 1507nF for IIB                           | 81 nF; for IIC, 651nF for IIB                             |
| • $I_o$ (short-circuit current), max.            |                                                           |                                                           | 118 mA                                                    | 110 mA                                                    |
| • $L_o$ (permissible external inductivity), max. |                                                           |                                                           | 1.7 mH; For IIC, 10.4 mH for IIB                          | 1.7 mH; For IIC, 11.5 mH for IIB                          |
| • $P_o$ (power of load), max.                    |                                                           |                                                           | 572 mW                                                    | 764 mW                                                    |
| • $U_o$ (output no-load voltage), max.           |                                                           |                                                           | 19.4 V                                                    | 27.9 V                                                    |
| • $T_a$ (permissible ambient temperature), max.  | 70 °C                                                     | 70 °C                                                     |                                                           |                                                           |

**Technical specifications** (continued)

|                                                | 6ES7 132-7GD00-0AB0                                                      | 6ES7 132-7GD10-0AB0                                                       | 6ES7 132-7GD21-0AB0                                                      | 6ES7 132-7GD30-0AB0                                        |
|------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------|
| <b>Parameter</b>                               |                                                                          |                                                                           |                                                                          |                                                            |
| Remark                                         | 14 byte                                                                  | 14 byte                                                                   |                                                                          |                                                            |
| Diagnostics: wire break                        | yes                                                                      | yes                                                                       | yes                                                                      | yes                                                        |
| Diagnostics: short circuit                     | yes                                                                      | yes                                                                       | yes                                                                      | yes                                                        |
| Behavior on CPU/Master STOP, channel-wise      | yes                                                                      | yes                                                                       | Substitute a value/keep last value                                       | Substitute a value/keep last value                         |
| <b>Alarms/diagnostics/status information</b>   |                                                                          |                                                                           |                                                                          |                                                            |
| Status indicator                               |                                                                          |                                                                           | Yes                                                                      | Yes                                                        |
| Substitute values connectable                  |                                                                          |                                                                           | Yes                                                                      | Yes                                                        |
| Alarms                                         |                                                                          |                                                                           |                                                                          |                                                            |
| • Alarms                                       |                                                                          |                                                                           | No                                                                       |                                                            |
| • Diagnostic alarm                             | Yes                                                                      | Yes                                                                       | Yes; parameterizable                                                     | Yes; parameterizable                                       |
| Diagnostics                                    |                                                                          |                                                                           |                                                                          |                                                            |
| • Diagnostic functions                         | Yes                                                                      | Yes                                                                       |                                                                          |                                                            |
| • Diagnostic information readable              | Yes                                                                      | Yes                                                                       | Yes                                                                      | Yes                                                        |
| • Wire break                                   | Yes; R > 10 kOhm, I < 100 µA                                             | Yes; R > 10 kOhm, I < 100 µA                                              | Yes; R > 10 kOhm, I < 100 µA                                             | Yes; R > 10 kOhm, I < 100 µA                               |
| • Short circuit                                | Yes; R < 80 Ohm (one output), R < 40 Ohm (outputs connected in parallel) | Yes; R < 800 Ohm (one output), R < 40 Ohm (outputs connected in parallel) | Yes; R < 80 Ohm (one output), R < 40 Ohm (outputs connected in parallel) | Yes; R < 80 Ohm                                            |
| diagnostic indication LED                      |                                                                          |                                                                           |                                                                          |                                                            |
| • Group error SF (red)                         | Yes                                                                      | Yes                                                                       | Yes                                                                      | Yes                                                        |
| • Status indicator digital output (green)      | Yes                                                                      | Yes                                                                       | Yes; per channel                                                         | Yes; per channel                                           |
| <b>Galvanic isolation</b>                      |                                                                          |                                                                           |                                                                          |                                                            |
| Galvanic isolation digital outputs             |                                                                          |                                                                           |                                                                          |                                                            |
| • between the channels                         |                                                                          |                                                                           | No                                                                       | No                                                         |
| • between the channels and the backplane bus   |                                                                          |                                                                           | Yes                                                                      | Yes                                                        |
| • between the channels and the load voltage L+ |                                                                          |                                                                           | Yes                                                                      | Yes                                                        |
| <b>Permissible potential difference</b>        |                                                                          |                                                                           |                                                                          |                                                            |
| between different circuits                     |                                                                          |                                                                           | 60 V DC/30 V AC                                                          | 60 V DC/30 V AC                                            |
| <b>Standards, approvals, certificates</b>      |                                                                          |                                                                           |                                                                          |                                                            |
| CE mark                                        | Yes                                                                      | Yes                                                                       | Yes                                                                      | Yes                                                        |
| Type of protection acc. to EN 50020 (CENELEC)  | II 2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I                      | II 2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I                       | II 2 G (1) GD and I M2 Ex ib[ia][iaD] IIC T4; Ex ib [ia] I               | II 2 G (1) GD and I M2 Ex ib[ia][iaD] IIC T4; Ex ib [ia] I |
| Type of protection acc. to KEMA                | Not relevant                                                             | Not relevant                                                              | 04 ATEX 1249                                                             | 04 ATEX 1249                                               |
| <b>Dimensions and weight</b>                   |                                                                          |                                                                           |                                                                          |                                                            |
| Dimensions                                     |                                                                          |                                                                           |                                                                          |                                                            |
| • Width                                        | 30 mm                                                                    | 30 mm                                                                     | 30 mm                                                                    | 30 mm                                                      |
| • Height                                       | 129 mm                                                                   | 129 mm                                                                    | 129 mm                                                                   | 129 mm                                                     |
| • Depth                                        | 136.5 mm                                                                 | 136.5 mm                                                                  | 136.5 mm                                                                 | 136.5 mm                                                   |
| Weight                                         |                                                                          |                                                                           |                                                                          |                                                            |
| • Weight, approx.                              | 255 g                                                                    | 255 g                                                                     | 255 g                                                                    | 255 g                                                      |

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Digital electronic modules

#### Technical specifications (continued)

| 6ES7 132-7HB00-0AB0                                                                                                                                                                                                                   |                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <b>Current consumption</b><br>from load voltage L+ (without load), max.                                                                                                                                                               | 120 mA                                                   |
| <b>Current consumption/ power loss</b><br>Power loss, typ.                                                                                                                                                                            | 1 W                                                      |
| <b>Digital outputs</b><br>Quantity/binary outputs                                                                                                                                                                                     | 2                                                        |
| Functionality/short-circuit strength                                                                                                                                                                                                  | Yes                                                      |
| Output current<br>• for signal "1" rated value                                                                                                                                                                                        | 2 A                                                      |
| Output delay with resistive load<br>• 0 to "1", max.<br>• 1 to "0", max.                                                                                                                                                              | 8 ms<br>3 ms                                             |
| Parallel switching of 2 outputs<br>• for increased power<br>• for redundant control of a load                                                                                                                                         | No<br>No                                                 |
| Switching frequency<br>• with resistive load, max.<br>• with inductive load, max.                                                                                                                                                     | 0.5 Hz; see data in manual<br>0.2 Hz; see data in manual |
| Cable length<br>• Cable length, shielded, max.<br>• Cable length unshielded, max.                                                                                                                                                     | 500 m<br>500 m                                           |
| <b>Relay outputs</b><br>Switching capacity of contacts<br>• at ohmic load, up to 60 °C, max.<br>• thermal continuous current, max.                                                                                                    | 2 A; see data in manual<br>2 A; see data in manual       |
| <b>Ex(i) characteristics</b><br>Max. values of output circuits (per channel)<br>• U <sub>o</sub> (output no-load voltage), max.<br>• U <sub>m</sub> (fault voltage), max.<br>• T <sub>a</sub> (permissible ambient temperature), max. | 60 V<br>250 V<br>70 °C                                   |

| 6ES7 132-7HB00-0AB0                                                                                                                                                                         |                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Alarms/diagnostics/status information</b><br>Substitute values connectable                                                                                                               | Yes                                                                                                           |
| Alarms<br>• Alarms<br>• Diagnostic alarm<br>• Process alarm                                                                                                                                 | No<br>Yes<br>No                                                                                               |
| Diagnostics<br>• Diagnostic information readable<br>• Wire break<br><br>• Short circuit                                                                                                     | Yes<br>No; cannot be determined in contact power circuit<br>No; cannot be determined in contact power circuit |
| diagnostic indication LED<br>• Group error SF (red)<br>• Status indicator digital output (green)                                                                                            | Yes<br>Yes; per channel                                                                                       |
| <b>Galvanic isolation</b><br>Galvanic isolation digital outputs<br>• between the channels<br>• between the channels and the backplane bus<br>• between the channels and the load voltage L+ | Yes<br>Yes<br>Yes; channels and power bus                                                                     |
| <b>Standards, approvals, certificates</b><br>CE mark                                                                                                                                        | Yes                                                                                                           |
| Type of protection acc. to EN 50020 (CENELEC)                                                                                                                                               | II 2 G and I M2 Ex eibmb IIC T4; Ex eibmb I                                                                   |
| Type of protection acc. to KEMA                                                                                                                                                             | 07 ATEX 0180                                                                                                  |
| <b>Dimensions and weight</b><br>Dimensions and weight<br>• Width<br>• Height<br>• Depth                                                                                                     | 30 mm<br>129 mm<br>136.5 mm                                                                                   |
| Weight<br>• Weight, approx.                                                                                                                                                                 | 280 g                                                                                                         |

|                                                                                         | 6ES7 193-7CA00-0AA0      | 6ES7 193-7CA10-0AA0      | 6ES7 193-7CB00-0AA0                       |
|-----------------------------------------------------------------------------------------|--------------------------|--------------------------|-------------------------------------------|
| <b>Standards, approvals, certificates</b><br>CE mark                                    | No                       | No                       | Yes                                       |
| Type of protection acc. to EN 50020 (CENELEC)                                           | No                       | No                       | II 2 G and I M2 Ex deib IIC T4; Ex deib I |
| Test number KEMA                                                                        | 04 ATEX 2242             | 04 ATEX 2242             | 07 ATEX 0205                              |
| <b>Dimensions and weight</b><br>Dimensions and weight<br>• Width<br>• Height<br>• Depth | 60 mm<br>190 mm<br>52 mm | 60 mm<br>190 mm<br>52 mm | 60 mm<br>190 mm<br>52 mm                  |
| Weight<br>• Weight, approx.                                                             | 275 g                    | 275 g                    | 340 g                                     |

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Order No.                                  | Order No.                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|------------------------------------------------------------------------------------------|
| <b>Digital input modules</b><br>8 x DI Namur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |                                                                                          |
| <b>Digital input module 8 DI NAMUR</b><br><br>Digital output modules for EEX i<br>4 x DO; 1 additional intrinsically safe input for "H" shut-off                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6ES7 131-7RF00-0AB0                        |                                                                                          |
| <b>Digital output module 4 DO 23.1 V DC/20 mA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6ES7 132-7RD01-0AB0                        |                                                                                          |
| <b>Digital output module 4 DO 17.4 V DC/27 mA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6ES7 132-7RD11-0AB0                        |                                                                                          |
| <b>Digital output module 4 DO 17.4 V DC/40 mA</b><br><br>4 x DO; 1 additional intrinsically safe input for "L" shut-off                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6ES7 132-7RD22-0AB0                        |                                                                                          |
| <b>Digital output module 4 DO 23.1 V DC/20 mA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6ES7 132-7GD00-0AB0                        |                                                                                          |
| <b>Digital output module 4 DO 17.4 V DC/27 mA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6ES7 132-7GD10-0AB0                        |                                                                                          |
| <b>Digital output module 4 DO 17.4 V DC/40 mA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6ES7 132-7GD21-0AB0                        |                                                                                          |
| <b>Digital output module 4 DO 25.4 V DC/22 mA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6ES7 132-7GD30-0AB0                        |                                                                                          |
| Digital output modules for EEX e                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                                                                                          |
| <b>Digital output module 2 DO relay, 60 V UC, 2 A</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6ES7 132-7HB00-0AB0                        |                                                                                          |
| Terminal modules                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                                                                                          |
| <b>TM-EM/EM60S</b><br><br>For accommodating all electronic modules except 2 DO relay; screw-type terminals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 6ES7 193-7CA00-0AA0                        |                                                                                          |
| <b>TM-EM/EM60C</b><br><br>For accommodating all electronic modules except 2 DO relay; spring-loaded terminals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 6ES7 193-7CA10-0AA0                        |                                                                                          |
| <b>TM-RM/RM 60S</b><br><br>For accommodating digital output module 2 DO relay and spare modules; screw-type terminal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6ES7 193-7CB00-0AA0                        |                                                                                          |
| Accessories                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                            |                                                                                          |
| <b>ET 200iSP manual</b><br>• German<br>• English                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6ES7 152-1AA00-8AA0<br>6ES7 152-1AA00-8BA0 |                                                                                          |
| <b>Connectors</b><br><br>PROFIBUS connector with active terminating resistor<br><br>For RS 485-IS circuit; 1.5 Mbit/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6ES7 972-0DA60-0XA0                        |                                                                                          |
| <b>RS 485-IS coupler</b><br><br>Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6ES7 972-0AC80-0XA0                        |                                                                                          |
| <b>Labeling sheet</b><br><br>DIN A4, perforated, each consisting of 10 sheets of 30 strips each, used for electronic modules and 20 strips, used for IM 151<br>• petrol<br>• red<br>• yellow<br>• light beige                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                            | 6ES7 193-7BH00-0AA0<br>6ES7 193-7BD00-0AA0<br>6ES7 193-7BB00-0AA0<br>6ES7 193-7BA00-0AA0 |
| <b>Labels, inscribed</b><br><br>Ordering unit 1 set with 200 units each for slot numbering<br>• 10 x slots 1 to 2<br>• 5 x slots 1 to 40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                            | 8WA8 861-0AB<br>8WA8 861-0AC                                                             |
| <b>Labels, blank</b><br><br>Ordering unit 1 set with 200 units each for slot numbering                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                            | 8WA8 848-2AY                                                                             |
| <b>S7-300 mounting rails</b><br><br>Standard rail 585 mm<br>Standard rail 885 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                            | 6ES7 390-1AF85-0AA0<br>6ES7 390-1AJ85-0AA0                                               |
| <b>Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e</b><br><br>Empty enclosure without installation of modules, for use in gaseous area, IP65 (IP54 when using a breather gland)<br>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs<br>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units)<br>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs<br>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units) |                                            | 6DL2 804-0AD30<br><br>6DL2 804-0AD50<br><br>6DL2 804-0AE30<br><br>6DL2 804-0AE50         |

I: Subject to export regulations AL: N and ECCN: EAR99H



# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Digital electronic modules

#### Ordering data

#### Order No.

#### Order No.

Empty enclosure without installation of modules, for use in dusty area, IP65

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dusty area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dusty area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dusty area, with 5 rows of M16 cable entries (111 units)

**6DL2 804-0DD30**

**6DL2 804-0DD50**

**6DL2 804-0DE30**

**6DL2 804-0DE50**

Enclosure with installation of ET 200iSP modules for use in gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units)

**6DL2 804-1AD30**

**6DL2 804-1AD50**

**6DL2 804-1AE30**

**6DL2 804-1AE50**

Enclosure with installation of modules, for use in dusty area, IP65; the ET 200iSP components must be ordered separately

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dusty area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dusty area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dusty area, with 5 rows of M16 cable entries (111 units)

**6DL2 804-1DD30**

**6DL2 804-1DD50**

**6DL2 804-1DE30**

**6DL2 804-1DE50**

I: Subject to export regulations AL: N and ECCN: EAR99H

### Overview



- The electronic modules are plugged into the associated terminal modules that must be ordered separately (with screw-type or spring-loaded terminals)
- When plugged in, the modules are automatically uniquely coded mechanically
- Modules can be replaced under potentially explosive conditions during runtime

### Technical specifications

|                                                                                                               | 6ES7 134-7SD00-0AB0                                          | 6ES7 134-7SD51-0AB0                                          | 6ES7 134-7TD00-0AB0                                          | 6ES7 134-7TD50-0AB0                                          |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|
| <b>Supply voltages</b><br>Power supply to the transmitters<br>• short-circuit proof<br>• supply current, max. |                                                              |                                                              | Yes<br>23 mA; per channel                                    |                                                              |
| <b>Current consumption</b><br>from supply voltage L+, max.                                                    | 30 mA                                                        | 22 mA                                                        | 320 mA                                                       | 30 mA                                                        |
| <b>Current consumption/ power loss</b><br>Power loss, typ.                                                    | 0.4 W                                                        | 0.4 W                                                        | 2.7 W                                                        | 0.4 W                                                        |
| <b>Analog inputs</b><br>Number of analog inputs                                                               | 4                                                            | 4                                                            | 4                                                            | 4                                                            |
| Cable length, shielded, max.                                                                                  | 50 m                                                         | 500 m                                                        | 500 m                                                        | 500 m                                                        |
| Cycle time (all channels) max.                                                                                | Number of active channels per module x basic conversion time | Number of active channels per module x basic conversion time | Number of active channels per module x basic conversion time | Number of active channels per module x basic conversion time |
| Technical unit for temperature measurement adjustable                                                         | Yes                                                          | Yes                                                          | Yes                                                          | Yes                                                          |
| • Voltage                                                                                                     | Yes                                                          | No                                                           | No                                                           | No                                                           |
| • Current                                                                                                     | No                                                           | No                                                           | Yes                                                          | Yes                                                          |
| • Thermocouple                                                                                                | Yes                                                          | No                                                           | No                                                           | No                                                           |
| • Resistance thermometer                                                                                      | No                                                           | Yes                                                          | No                                                           | No                                                           |
| • Resistance                                                                                                  | No                                                           | Yes                                                          | No                                                           | No                                                           |
| Input ranges (rated values), voltages<br>• -80 mV to +80 mV<br>• Input resistance (-80 mV to +80 mV)          | Yes<br>1 000 kΩ                                              |                                                              |                                                              |                                                              |
| Input ranges (rated values), currents<br>• 4 to 20 mA                                                         |                                                              |                                                              | Yes                                                          | Yes; min. 295 Ohm                                            |

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Analog electronic modules

#### Technical specifications (continued)

|                                                                         | 6ES7 134-7SD00-0AB0                                                                    | 6ES7 134-7SD51-0AB0 | 6ES7 134-7TD00-0AB0 | 6ES7 134-7TD50-0AB0 |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|
| Input ranges (rated values), thermoelements                             |                                                                                        |                     |                     |                     |
| • Type B                                                                | Yes                                                                                    |                     |                     |                     |
| • Input resistance (Type B)                                             | 1 000 kΩ                                                                               |                     |                     |                     |
| • Type C                                                                | Yes                                                                                    |                     |                     |                     |
| • Input resistance (Type C)                                             | 1 000 kΩ                                                                               |                     |                     |                     |
| • Type E                                                                | Yes                                                                                    |                     |                     |                     |
| • Input resistance (Type E)                                             | 1 000 kΩ                                                                               |                     |                     |                     |
| • Type J                                                                | Yes                                                                                    |                     |                     |                     |
| • Input resistance (type J)                                             | 1 000 kΩ                                                                               |                     |                     |                     |
| • Type K                                                                | Yes                                                                                    |                     |                     |                     |
| • Input resistance (Type K)                                             | 1 000 kΩ                                                                               |                     |                     |                     |
| • Type L                                                                | Yes                                                                                    |                     |                     |                     |
| • Input resistance (Type L)                                             | 1 000 kΩ                                                                               |                     |                     |                     |
| • Type N                                                                | Yes                                                                                    |                     |                     |                     |
| • Input resistance (Type N)                                             | 1 000 kΩ                                                                               |                     |                     |                     |
| • Type R                                                                | Yes                                                                                    |                     |                     |                     |
| • Input resistance (Type R)                                             | 1 000 kΩ                                                                               |                     |                     |                     |
| • Type S                                                                | Yes                                                                                    |                     |                     |                     |
| • Input resistance (Type S)                                             | 1 000 kΩ                                                                               |                     |                     |                     |
| • Type T                                                                | Yes                                                                                    |                     |                     |                     |
| • Input resistance (Type T)                                             | 1 000 kΩ                                                                               |                     |                     |                     |
| • Type U                                                                | Yes                                                                                    |                     |                     |                     |
| • Input resistance (Type U)                                             | 1 000 kΩ                                                                               |                     |                     |                     |
| Input ranges (rated values), resistance thermometers                    |                                                                                        |                     |                     |                     |
| • Ni 100                                                                |                                                                                        | Yes                 |                     |                     |
| • Input resistance (Ni 100)                                             |                                                                                        | 2 000 kΩ            |                     |                     |
| • Pt 100                                                                |                                                                                        | Yes                 |                     |                     |
| • Input resistance (Pt 100)                                             |                                                                                        | 2 000 kΩ            |                     |                     |
| Input ranges (rated values), resistors                                  |                                                                                        |                     |                     |                     |
| • 0 to 600 Ohm                                                          |                                                                                        | Yes; also 1000 Ohm  |                     |                     |
| • Input resistance (0 to 600 Ohm)                                       |                                                                                        | 1 000 kΩ            |                     |                     |
| Current input                                                           |                                                                                        |                     |                     |                     |
| • permissible input current for current input (destruction limit), max. |                                                                                        |                     | 90 mA               | 50 mA               |
| Characteristic linearization                                            |                                                                                        |                     |                     |                     |
| • parameterizable                                                       | Yes                                                                                    | Yes                 |                     |                     |
| • for thermocouples                                                     | 1                                                                                      |                     |                     |                     |
| • for resistance thermometer                                            |                                                                                        | yes                 |                     |                     |
| Temperature compensation                                                |                                                                                        |                     |                     |                     |
| • internal temperature compensation                                     | Yes; via supplied TC sensor module                                                     |                     |                     |                     |
| • external temperature compensation with compensations socket           | Yes; via temperature value, acquired by an analog module of the same ET 200iSP station |                     |                     |                     |

## Technical specifications (continued)

|                                                                        | 6ES7 134-7SD00-0AB0            | 6ES7 134-7SD51-0AB0                                                        | 6ES7 134-7TD00-0AB0       | 6ES7 134-7TD50-0AB0       |
|------------------------------------------------------------------------|--------------------------------|----------------------------------------------------------------------------|---------------------------|---------------------------|
| <b>Analog value creation</b>                                           |                                |                                                                            |                           |                           |
| Measurement principle                                                  | integrating (Sigma-Delta)      | integrating (Sigma-Delta)                                                  | integrating (Sigma-Delta) | integrating (Sigma-Delta) |
| Integrations and conversion time/ resolution per channel               |                                |                                                                            |                           |                           |
| • Resolution with overrange (bit including sign), max.                 | 16 bit                         | 16 bit                                                                     | 13 bit                    | 12 bit; + sign            |
| • Integration time, parameterizable                                    | Yes                            | Yes                                                                        | No                        | Yes                       |
| • Basic conversion time, including integration time, ms                | 80 ms at 50 Hz; 66 ms at 60 Hz | 80 ms at 50 Hz; 66 ms at 60 Hz                                             |                           | 30                        |
| - additional conversion time for wire break monitoring                 | 5                              | 5                                                                          |                           |                           |
| • Interference voltage suppression for interference frequency f1 in Hz | 50 / 60 Hz                     | 50 / 60 Hz                                                                 | 50 / 60 Hz                | 50 / 60 Hz                |
| <b>Smoothering of measured values</b>                                  |                                |                                                                            |                           |                           |
| • parameterizable                                                      | Yes; in 4 stages               | Yes; in 4 stages                                                           | Yes; in 4 stages          | Yes; in 4 stages          |
| • Step: None                                                           | Yes; 1 x cycle time            | Yes; 1 x cycle time                                                        | Yes; 1 x cycle time       | Yes; 1 x cycle time       |
| • Step: Low                                                            | Yes; 4 x cycle time            | Yes; 4 x cycle time                                                        | Yes; 4 x cycle time       | Yes; 4 x cycle time       |
| • Step: Medium                                                         | Yes; 32 x cycle time           | Yes; 32 x cycle time                                                       | Yes; 32 x cycle time      | Yes; 32 x cycle time      |
| • Step: High                                                           | Yes; 64 x cycle time           | Yes; 64 x cycle time                                                       | Yes; 64 x cycle time      | Yes; 64 x cycle time      |
| <b>Encoder</b>                                                         |                                |                                                                            |                           |                           |
| Connection of signal encoders                                          |                                |                                                                            |                           |                           |
| • for current measurement as 2-wire transducer                         |                                |                                                                            | Yes                       |                           |
| • for current measurement as 4-wire transducer                         |                                |                                                                            |                           | Yes                       |
| • for resistance measurement with 2-conductor connection               |                                | Yes                                                                        |                           |                           |
| • for resistance measurement with 3-conductor connection               |                                | Yes                                                                        |                           |                           |
| • for resistance measurement with 4-conductor connection               |                                | Yes                                                                        |                           |                           |
| • Burden of 2-wire transmitter, max.                                   |                                |                                                                            | 750 Ω                     |                           |
| <b>Errors/accuracies</b>                                               |                                |                                                                            |                           |                           |
| Linearity error (relative to input area)                               | +/- 0.015 %                    | +/- 0.015 %                                                                | +/- 0.015 %               | +/- 0.015 %               |
| Temperature error (relative to input area)                             | +/- 0.02 %                     | +/- 0.02 %                                                                 | +/- 0.005 %/K             | +/- 0.005 %/K             |
| Crosstalk between the inputs, min.                                     | -50 dB                         | -50 dB                                                                     | -50 dB                    | -50 dB                    |
| Repeat accuracy in settled status at 25 °C (relative to input area)    | +/- 0.01 %                     | +/- 0.01 %                                                                 | +/- 0.01 %                | +/- 0.01 %                |
| Operational limit in overall temperature range                         |                                |                                                                            |                           |                           |
| • Voltage, relative to input area                                      | +/- 0.15 %                     |                                                                            | +/- 0.15 %                | +/- 0.15 %                |
| • Current, relative to input area                                      |                                |                                                                            |                           |                           |
| • Resistance-type thermometer, relative to input area                  |                                | +/- 0.15 %; Applies for resistances standard<br>+/- 0.8K climatic +/- 0.3K |                           |                           |

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Analog electronic modules

#### Technical specifications (continued)

|                                                                                                                                                                                         | 6ES7 134-7SD00-0AB0                                   | 6ES7 134-7SD51-0AB0                                                       | 6ES7 134-7TD00-0AB0                                   | 6ES7 134-7TD50-0AB0                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| Basic error limit (operational limit at 25 °C)                                                                                                                                          |                                                       |                                                                           |                                                       |                                                       |
| <ul style="list-style-type: none"> <li>Voltage, relative to input area</li> <li>Current, relative to input area</li> <li>Resistance-type thermometer, relative to input area</li> </ul> | +/- 0.1 %                                             | +/- 0.1 %; applies for resistances standard<br>+/- 0.5K climatic +/- 0.2K | +/- 0.1 %                                             | +/- 0.1 %                                             |
| Interference voltage suppression for $f = n \times$ (fl +/- 1%), fl = interference frequency                                                                                            |                                                       |                                                                           |                                                       |                                                       |
| <ul style="list-style-type: none"> <li>Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>Common mode interference, min.</li> </ul>   | 70 dB<br><br>90 dB                                    | 70 dB<br><br>90 dB                                                        | 70 dB                                                 | 70 dB                                                 |
| <b>Alarms/diagnostics/status information</b>                                                                                                                                            |                                                       |                                                                           |                                                       |                                                       |
| Alarms                                                                                                                                                                                  |                                                       |                                                                           |                                                       |                                                       |
| <ul style="list-style-type: none"> <li>Diagnostic alarm</li> <li>Limit value alarm</li> </ul>                                                                                           | Yes; parameterizable<br>Yes; parameterizable          | Yes<br>Yes                                                                | Yes; parameterizable<br>Yes; parameterizable          | Yes; parameterizable<br>Yes; parameterizable          |
| Diagnostics                                                                                                                                                                             |                                                       |                                                                           |                                                       |                                                       |
| <ul style="list-style-type: none"> <li>Diagnostic information readable</li> <li>Wire break</li> <li>Short circuit</li> <li>Group error</li> </ul>                                       | Yes                                                   | Yes<br><br>Yes<br>Yes<br>Yes                                              | Yes<br><br>Yes<br>Yes                                 | Yes<br><br>Yes                                        |
| Diagnostic indication LED                                                                                                                                                               |                                                       |                                                                           |                                                       |                                                       |
| <ul style="list-style-type: none"> <li>Group error SF (red)</li> </ul>                                                                                                                  | Yes                                                   | Yes                                                                       | Yes                                                   | Yes                                                   |
| <b>Galvanic isolation</b>                                                                                                                                                               |                                                       |                                                                           |                                                       |                                                       |
| Galvanic isolation analog inputs                                                                                                                                                        |                                                       |                                                                           |                                                       |                                                       |
| <ul style="list-style-type: none"> <li>between the channels</li> <li>between the channels and the backplane bus</li> <li>between the channels and the load voltage L+</li> </ul>        | Yes; functional, yes<br>Yes                           | No<br>Yes<br><br>Yes; channels and Power Bus                              | No<br>Yes                                             | No<br>Yes                                             |
| <b>Standards, approvals, certificates</b>                                                                                                                                               |                                                       |                                                                           |                                                       |                                                       |
| CE mark                                                                                                                                                                                 | Yes                                                   | Yes                                                                       | Yes                                                   | Yes                                                   |
| Type of protection acc. to EN 50020 (CENELEC)                                                                                                                                           | II2 G (1) GD Ex ib[ia]<br>IIC T4 and I M2 Ex ib[ia] I | II2 G (1) GD Ex ib[ia]<br>IIC T4 and I M2 Ex ib[ia] I                     | II2 G (1) GD Ex ib[ia]<br>IIC T4 and I M2 Ex ib[ia] I | II2 G (1) GD Ex ib[ia]<br>IIC T4 and I M2 Ex ib[ia] I |
| Type of protection acc. to KEMA                                                                                                                                                         | 04 ATEX 1246                                          | 04 ATEX 1247                                                              | 04 ATEX 1244                                          | 04 ATEX 1245                                          |
| <b>Dimensions and weight</b>                                                                                                                                                            |                                                       |                                                                           |                                                       |                                                       |
| Dimensions and weight                                                                                                                                                                   |                                                       |                                                                           |                                                       |                                                       |
| <ul style="list-style-type: none"> <li>Width</li> <li>Height</li> <li>Depth</li> </ul>                                                                                                  | 30 mm<br>129 mm<br>136.5 mm                           | 30 mm<br>129 mm<br>136.5 mm                                               | 30 mm<br>129 mm<br>136.5 mm                           | 30 mm<br>129 mm<br>136.5 mm                           |
| Weight                                                                                                                                                                                  |                                                       |                                                                           |                                                       |                                                       |
| <ul style="list-style-type: none"> <li>Weight, approx.</li> </ul>                                                                                                                       | 230 g                                                 | 230 g                                                                     | 230 g                                                 | 230 g                                                 |

**Technical specifications (continued)**

| 6ES7 135-7TD00-0AB0                                                                                                                                      |                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>Current consumption</b><br>from load voltage 1L+, max.                                                                                                | 330 mA                 |
| <b>Power losses</b><br>Power loss, max.                                                                                                                  | 2.7 W                  |
| <b>Analog outputs</b><br>Number of analog outputs                                                                                                        | 4                      |
| Cable length, shielded, max.                                                                                                                             | 500 m                  |
| Output ranges, current<br>• 4 to 20 mA                                                                                                                   | Yes                    |
| Connection of actuators<br>• for current output 2-conductor connection                                                                                   | Yes                    |
| Load impedance<br>(in rated range of output)<br>• with current outputs, max.                                                                             | 750 Ω                  |
| <b>Analog value creation</b><br>Integrations and conversion time/<br>resolution per channel<br>• Resolution with overrange<br>(bit including sign), max. | 14 bit                 |
| Settling time<br>• for resistive load<br>• for capacitive load<br>• for inductive load                                                                   | 4 ms<br>40 ms<br>40 ms |
| <b>Errors/accuracies</b><br>Linearity error (relative to output area)                                                                                    | +/- 0.015 %            |
| Temperature error<br>(relative to output area)                                                                                                           | +/- 0.005 %/K          |
| Crosstalk between the outputs, min.                                                                                                                      | -50 dB                 |
| Repeat accuracy in settled status at 25 °C (relative to output area)                                                                                     | +/- 0.01 %             |

| 6ES7 135-7TD00-0AB0                                                                                                                      |                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Operational limit in overall temperature range<br>• Current, relative to output area                                                     | +/- 0.15 %                                          |
| Basic error limit<br>(operational limit at 25 °C)<br>• Current, relative to output area                                                  | +/- 0.1 %                                           |
| <b>Alarms/diagnostics/status information</b><br>Substitute values connectable                                                            | Yes                                                 |
| Alarms<br>• Diagnostic alarm                                                                                                             | Yes                                                 |
| Diagnostics<br>• Diagnostic information readable<br>• Wire break<br>• Short circuit                                                      | Yes<br>Yes<br>Yes                                   |
| Diagnostics indication LED<br>• Group error SF (red)                                                                                     | Yes                                                 |
| <b>Galvanic isolation</b><br>Galvanic isolation analog outputs<br>• between the channels<br>• between the channels and the backplane bus | No<br>Yes                                           |
| <b>Standards, approvals, certificates</b><br>Type of protection acc. to EN 50020 (CENELEC)                                               | II 2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I |
| Type of protection acc. to KEMA                                                                                                          | 04 ATEX 1250                                        |
| <b>Dimensions and weight</b><br>Dimensions<br>• Width<br>• Height<br>• Depth                                                             | 30 mm<br>129 mm<br>136.5 mm                         |
| Weight<br>• Weight, approx.                                                                                                              | 265 g                                               |

|                                                                                         | 6ES7 193-7CA00-0AA0      | 6ES7 193-7CA10-0AA0      | 6ES7 193-7CB00-0AA0                       |
|-----------------------------------------------------------------------------------------|--------------------------|--------------------------|-------------------------------------------|
| <b>Standards, approvals, certificates</b><br>CE mark                                    | No                       | No                       | Yes                                       |
| Type of protection acc. to EN 50020 (CENELEC)                                           | No                       | No                       | II 2 G and I M2 Ex deib IIC T4; Ex deib I |
| Test number KEMA                                                                        | 04 ATEX 2242             | 04 ATEX 2242             | 07 ATEX 0205                              |
| <b>Dimensions and weight</b><br>Dimensions and weight<br>• Width<br>• Height<br>• Depth | 60 mm<br>190 mm<br>52 mm | 60 mm<br>190 mm<br>52 mm | 60 mm<br>190 mm<br>52 mm                  |
| Weight<br>• Weight, approx.                                                             | 275 g                    | 275 g                    | 340 g                                     |

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Analog electronic modules

| Ordering data                                                                                                                  | Order No.           | Order No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Analog input modules</b>                                                                                                    |                     | <b>Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e</b><br><br>Empty enclosure without installation of modules, for use in a gaseous area, IP65 (IP54 when using a breather gland) <ul style="list-style-type: none"><li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs</li><li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (66 units)</li><li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs</li><li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (111 units)</li></ul> |
| 4 AI   2WIRE HART                                                                                                              | 6ES7 134-7TD00-0AB0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4 AI   4WIRE HART                                                                                                              | 6ES7 134-7TD50-0AB0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4 AI RTD                                                                                                                       | 6ES7 134-7SD51-0AB0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4 AI TC                                                                                                                        | 6ES7 134-7SD00-0AB0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Analog output modules</b>                                                                                                   |                     | <b>6DL2 804-0AD30</b><br><br><b>6DL2 804-0AD50</b><br><br><b>6DL2 804-0AE30</b><br><br><b>6DL2 804-0AE50</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 4 AO   HART                                                                                                                    | 6ES7 135-7TD00-0AB0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Terminal modules</b>                                                                                                        |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| TM-EM/EM60S                                                                                                                    | 6ES7 193-7CA00-0AA0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Terminal module E60S (screw-type terminal)                                                                                     |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| TM-EM/EM60C                                                                                                                    | 6ES7 193-7CA10-0AA0 | <b>6DL2 804-0DD30</b><br><br><b>6DL2 804-0DD50</b><br><br><b>6DL2 804-0DE30</b><br><br><b>6DL2 804-0DE50</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Terminal module E60C (spring-loaded terminal)                                                                                  |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Accessories</b>                                                                                                             |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| ET 200iSP manual                                                                                                               |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| • German                                                                                                                       | 6ES7 152-1AA00-8AA0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| • English                                                                                                                      | 6ES7 152-1AA00-8BA0 | <b>6DL2 804-0DD30</b><br><br><b>6DL2 804-0DD50</b><br><br><b>6DL2 804-0DE30</b><br><br><b>6DL2 804-0DE50</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Connectors</b>                                                                                                              |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| PROFIBUS connector with active terminating resistor                                                                            | 6ES7 972-0DA60-0XA0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| For RS 485-IS circuit; 1.5 Mbit/s                                                                                              |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| RS 485-IS coupler                                                                                                              | 6ES7 972-0AC80-0XA0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS                                                       |                     | <b>6DL2 804-0DD30</b><br><br><b>6DL2 804-0DD50</b><br><br><b>6DL2 804-0DE30</b><br><br><b>6DL2 804-0DE50</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Labeling sheet</b>                                                                                                          |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| DIN A4, perforated, each consisting of 10 sheets of 30 strips each, used for electronic modules and 20 strips, used for IM 151 |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| • petrol                                                                                                                       | 6ES7 193-7BH00-0AA0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| • red                                                                                                                          | 6ES7 193-7BD00-0AA0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| • yellow                                                                                                                       | 6ES7 193-7BB00-0AA0 | <b>6DL2 804-0DD30</b><br><br><b>6DL2 804-0DD50</b><br><br><b>6DL2 804-0DE30</b><br><br><b>6DL2 804-0DE50</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| • light beige                                                                                                                  | 6ES7 193-7BA00-0AA0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Labels, inscribed</b>                                                                                                       |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Ordering unit 1 set with 200 units each for slot numbering                                                                     |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| • 10 x slots 1 to 2                                                                                                            | 8WA8 861-0AB        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| • 5 x slots 1 to 40                                                                                                            | 8WA8 861-0AC        | <b>6DL2 804-0DD30</b><br><br><b>6DL2 804-0DD50</b><br><br><b>6DL2 804-0DE30</b><br><br><b>6DL2 804-0DE50</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Labels, blank</b>                                                                                                           |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Ordering unit 1 set with 200 units each for slot numbering                                                                     | 8WA8 848-2AY        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>S7-300 mounting rails</b>                                                                                                   |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Standard rail 585 mm                                                                                                           | 6ES7 390-1AF85-0AA0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Standard rail 885 mm                                                                                                           | 6ES7 390-1AJ85-0AA0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Analog electronic modules

| Ordering data                                                                                                                                                                          | Order No.             |                                                                                                                                                                                      | Order No.             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Enclosure with installation of ET 200iSP modules for use in a gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately                   |                       | Enclosure with installation of modules, for use in a dusty area, IP65; the ET 200iSP components must be ordered separately                                                           |                       |
| • Wall enclosure 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs | <b>6DL2 804-1AD30</b> | • Wall enclosure 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs | <b>6DL2 804-1DD30</b> |
| • Wall enclosure 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (66 units)                              | <b>6DL2 804-1AD50</b> | • Wall enclosure 650 x 450 x 230, I for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (66 units)                              | <b>6DL2 804-1DD50</b> |
| • Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs | <b>6DL2 804-1AE30</b> | • Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs | <b>6DL2 804-1DE30</b> |
| • Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (111 units)                             | <b>6DL2 804-1AE50</b> | • Wall enclosure 950 x 450 x 230, I for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (111 units)                             | <b>6DL2 804-1DE50</b> |

I: Subject to export regulations AL: N and ECCN: EAR99H



# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Fail-safe electronic modules F digital input module

#### Overview



- Digital inputs for fail-safe SIMATIC S7 systems
- Can be used in the distributed ET 200iSP I/O device with IM 152-1

The digital electronic module 8 F-DI Ex NAMUR has the following features:

- Suitable for the connection of encoders from the hazardous area
- 8 inputs 1-channel (SIL2/Category 3/PLe) or 4 inputs 2-channel (SIL3/Category 4/PLe)
- Isolated from the power bus/backplane bus
- Suitable for the following sensors:
  - According to IEC 60947-5-6 or NAMUR (with diagnostic evaluation)
  - Wired mechanical contacts (with diagnostic evaluation)
  - Unwired mechanical contacts (with deactivated diagnostics)
- Programmable diagnostic interrupt
- Diagnostic buffer integrated in module
- Firmware update
- Identification data I&M
- Channel-selective passivation
- Supports time stamping
- Can only be used in safety mode

#### Technical specifications

| 6ES7 138-7FN00-0AB0                                        |                          |
|------------------------------------------------------------|--------------------------|
| <b>Current consumption</b><br>from supply voltage L+, max. | 150 mA; (int. power bus) |
| <b>Power losses</b><br>Power loss, typ.                    | 1.4 W                    |
| <b>Address area</b><br>Occupied address area               |                          |
| • Outputs                                                  | 4 byte                   |
| • Inputs                                                   | 6 byte                   |
| <b>FH technology</b><br>Module for fail-safe applications  | Yes                      |
| <b>Digital inputs</b><br>Number of digital inputs          | 8                        |
| Number of NAMUR inputs                                     | 8                        |
| Input current<br>• for signal "1", typ.                    | 9.5 mA                   |
| Input delay (for rated value of input voltage)             |                          |
| • for standard inputs                                      |                          |
| - at "0" to "1", min.                                      | 0.7 ms                   |
| - at "0" to "1", max.                                      | 16 ms; Parameterizable   |
| - at "1" to "0", min.                                      | 0.7 ms                   |
| - at "1" to "0", max.                                      | 16 ms; Parameterizable   |
| Cable length                                               |                          |
| • Cable length, shielded, max.                             | 500 m                    |
| • Cable length unshielded, max.                            | 200 m                    |
| <b>Encoder supply</b><br>Number of outputs                 | 8                        |
| Output voltage                                             | 8 V DC                   |

| 6ES7 138-7FN00-0AB0                                              |                                                                                                 |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Encoder</b><br>Number of connectable encoders, max.           | 8                                                                                               |
| Connectable encoders                                             |                                                                                                 |
| • NAMUR encoder                                                  | Yes                                                                                             |
| NAMUR encoder                                                    |                                                                                                 |
| • Input current, for signal "0", max.                            | 1.2 mA                                                                                          |
| • Input current, for signal "1", min.                            | 2.1 mA                                                                                          |
| <b>Parameter</b><br>Diagnostics: wire break                      | Channel by channel                                                                              |
| Diagnostics: short circuit                                       | Channel by channel                                                                              |
| <b>Alarms/diagnostics/status information</b><br>Status indicator | Yes                                                                                             |
| Alarms                                                           |                                                                                                 |
| • Diagnostic alarm                                               | Yes; Parameterizable                                                                            |
| • Process alarm                                                  | No                                                                                              |
| Diagnostics                                                      |                                                                                                 |
| • Diagnostic functions                                           | Yes                                                                                             |
| • Diagnostic information readable                                | Yes                                                                                             |
| • Wire break                                                     | Yes; NAMUR encoders or single contact with 10 kOhm parallel resistor                            |
| • Short circuit                                                  | Yes; R load < 150 Ohm with NAMUR sensor/sensor and NAMUR changeover contact/sensor to DIN 19234 |
| Diagnostic indication LED<br>• Group error SF (red)              | Yes                                                                                             |

## Technical specifications (continued)

| 6ES7 138-7FN00-0AB0                          |                                                                                                                                                                   |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Isolation</b>                             |                                                                                                                                                                   |
| Isolation checked with                       | 350 V AC/1 min between the shield and backplane bus connection 350 V AC/1 min between the shield and I/O 2830 V AC/1 min between backplane bus connection and I/O |
| <b>Galvanic isolation</b>                    |                                                                                                                                                                   |
| between the channels and backplane bus       | Yes                                                                                                                                                               |
| Galvanic isolation digital inputs            |                                                                                                                                                                   |
| • between the channels                       | No                                                                                                                                                                |
| • between the channels and the backplane bus | Yes                                                                                                                                                               |
| <b>Permissible potential difference</b>      |                                                                                                                                                                   |
| between different circuits                   | 60 V DC / 30 V AC                                                                                                                                                 |
| <b>Standards, approvals, certificates</b>    |                                                                                                                                                                   |
| CE mark                                      | Yes                                                                                                                                                               |

| 6ES7 138-7FN00-0AB0                            |                                                                             |
|------------------------------------------------|-----------------------------------------------------------------------------|
| Type of protection acc. to EN 50020 (CENELEC)  | II 2 G (1) GD Ex ib[ia Ga][ia IIIC Da] IIC T4 Gb and I M2 Ex ib[ia Ma] I Mb |
| Type of protection acc. to KEMA                | 10 ATEX 0056                                                                |
| Highest safety class achievable in safety mode |                                                                             |
| • acc. to EN 954                               | Cat. 3 (single-channel), Cat. 4 (two-channel)                               |
| • acc. to IEC 61508                            | SIL 3                                                                       |
| • Performance level acc. to EN ISO 13849-1     | PLe                                                                         |
| <b>Dimensions and weight</b>                   |                                                                             |
| Dimensions                                     |                                                                             |
| • Width                                        | 30 mm                                                                       |
| • Height                                       | 129 mm                                                                      |
| • Depth                                        | 136.5 mm                                                                    |
| Weight                                         |                                                                             |
| • Weight, approx.                              | 288 g                                                                       |

## Ordering data

| Order No.                                                                                                                                          |                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>F digital input modules</b>                                                                                                                     |                     |
| 8 F-DI Ex NAMUR                                                                                                                                    | 6ES7 138-7FN00-0AB0 |
| <b>Terminal modules</b>                                                                                                                            |                     |
| <b>TM-EM/EM60S</b>                                                                                                                                 | 6ES7 193-7CA00-0AA0 |
| Terminal module E60S (screw-type terminal)                                                                                                         |                     |
| <b>TM-EM/EM60C</b>                                                                                                                                 | 6ES7 193-7CA10-0AA0 |
| Terminal module E60C (spring-loaded terminal)                                                                                                      |                     |
| <b>Accessories</b>                                                                                                                                 |                     |
| <b>ET 200iSP Manual</b>                                                                                                                            |                     |
| • German                                                                                                                                           | 6ES7 152-1AA00-8AA0 |
| • English                                                                                                                                          | 6ES7 152-1AA00-8BA0 |
| <b>Cable connector</b>                                                                                                                             |                     |
| PROFIBUS cable connector with active terminating resistor                                                                                          | 6ES7 972-0DA60-0XA0 |
| For RS 485-IS electric circuit; 1.5 Mbit/s                                                                                                         |                     |
| <b>RS 485-IS coupler</b>                                                                                                                           | 6ES7 972-0AC80-0XA0 |
| Isolating transformer for connection of PROFIBUS DP and PROFIBUS RS 485-IS                                                                         |                     |
| <b>Labeling sheet</b>                                                                                                                              |                     |
| DIN A4, perforated, each consisting of 10 sheets of 30 strips each, can be used for electronic modules, and 20 strips each, can be used for IM 151 |                     |
| • petrol                                                                                                                                           | 6ES7 193-7BH00-0AA0 |
| • red                                                                                                                                              | 6ES7 193-7BD00-0AA0 |
| • yellow                                                                                                                                           | 6ES7 193-7BB00-0AA0 |
| • light beige                                                                                                                                      | 6ES7 193-7BA00-0AA0 |

## Order No.

|                                                                                              |                     |
|----------------------------------------------------------------------------------------------|---------------------|
| <b>Labels, inscribed</b>                                                                     |                     |
| Ordering unit: 1 set with 200 units each for slot numbering                                  |                     |
| • 10 x slots 1 to 2                                                                          | 8WA8 861-0AB        |
| • 5 x slots 1 to 40                                                                          | 8WA8 861-0AC        |
| <b>Labels, not inscribed</b>                                                                 | 8WA8 848-2AY        |
| Ordering unit: 1 set with 200 units each for slot numbering                                  |                     |
| <b>Distributed Safety V5.4 programming tool</b>                                              |                     |
| Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S |                     |
| Requirements: STEP 7 V5.3 SP3 and higher                                                     |                     |
| Floating License                                                                             | 6ES7 833-1FC02-0YA5 |
| Software Update Service (requires current software version)                                  | 6ES7 833-1FC00-0YX2 |
| <b>S7 F Systems RT License</b>                                                               | 6ES7 833-1CC00-6YX0 |
| For processing safety-related user programs, for one AS 412F/FH, AS 414F/FH or AS 417F/FH    |                     |

I: Subject to export regulations AL: N and ECCN: EAR99H

# ET 200iSP

## Fail-safe electronic modules

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Order No.                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Order No.                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <b>S7 F Systems V6.1</b><br>Programming and configuring environment for creating and operating safety-related STEP 7 programs for an S7 400H-based target system, Floating License for 1 user, executable under Windows XP Prof SP2/SP3, Windows Server 2003 SP2<br>2 languages (German, English)<br>Type of delivery: Certificate of License as well as software and electronic documentation on CD                                                                                                                                                                                                                                                                                   | <b>6ES7 833-1CC02-0YA5</b>                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                          |
| <b>SIMATIC Safety Matrix Tool V6.2</b><br>Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment<br>Including SIMATIC Safety Matrix Viewer for SIMATIC PCS 7, for operation and monitoring of the Safety Matrix in a SIMATIC PCS 7 environment with several operator control levels<br>1 language (English), executes with Windows XP Professional,<br>Type of delivery: Certificate of License and authorization diskette for Safety Matrix Tool and Safety Matrix Viewer; software and electronic documentation on CD<br>Floating License for 1 installation J<br>Floating License upgrade from V5.x/V6.x to V6.2 J | <b>6ES7 833-1SM02-0YA5</b><br><b>6ES7 833-1SM02-0YE5</b> | <b>SIMATIC Safety Matrix Editor V6.2</b><br>Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment<br>1 language (English), executes with Windows 2000 Professional or Windows XP Professional, single license for 1 installation<br>Type of supply: Certificate of License and authorization diskette; software and electronic documentation on CD                                                                                                | <b>6ES7 833-1SM42-0YA5</b>                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                          | <b>SIMATIC Safety Matrix Viewer V6.2 for SIMATIC PCS 7</b><br>Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several operator control levels<br>2 languages (English/German), runs under Windows 2000 Professional, Windows XP Professional, Windows 2003 Server<br>Type of delivery: Certificate of License and authorization diskette; software and electronic documentation on CD<br>Floating License for 1 installation J<br>Floating License upgrade from V6.x to V6.2 J | <b>6ES7 833-1SM62-0YA5</b><br><b>6ES7 833-1SM62-0YE5</b> |

J: Subject to export regulations AL: N and ECCN: EAR99S

## Overview



- Digital outputs for fail-safe SIMATIC S7 systems
- Can be used in the distributed ET 200iSP I/O device with IM 152-1

The digital electronic module 4 F-DO Ex 17.4 V/40 mA has the following properties:

- Suitable for the connection of actuators from the hazardous area
- 4 outputs, PP-switching (SIL3/Category 4/PLe)
- Isolated from the power bus/backplane bus
- Max. output current 40 mA
- Rated load voltage 17.4 V DC
- Short-circuit, overload and wire-break monitoring
- Suitable for Ex i solenoid valves, DC current relays and actuators
- To increase the power rating, two digital outputs can be connected in parallel for one actuator
- Programmable diagnostics
- Programmable diagnostic interrupt
- Diagnostic buffer integrated in module
- Firmware update
- Identification data I&M
- Channel-selective passivation
- Can only be used in safety mode

## Technical specifications

| 6ES7 138-7FD00-0AB0                       |                                                  |
|-------------------------------------------|--------------------------------------------------|
| <b>Current consumption</b>                |                                                  |
| from load voltage L+ (without load), max. | 510 mA; (int. power bus)                         |
| <b>Power losses</b>                       |                                                  |
| Power loss, typ.                          | 5.3 W; max.                                      |
| <b>Digital outputs</b>                    |                                                  |
| Number of digital outputs                 | 4                                                |
| Short-circuit protection                  | Yes                                              |
| • Response threshold, typ.                | Depending on the "short-circuit level" parameter |
| Controlling a digital input               | No                                               |
| No-load voltage U <sub>ao</sub> (DC)      | 17.4 V                                           |
| Internal resistor R <sub>i</sub>          | 167 Ω                                            |
| Trend key points E                        |                                                  |
| • Voltage U <sub>e</sub> (DC)             | 10 V                                             |
| • Current I <sub>e</sub>                  | 40 mA                                            |
| Output voltage                            |                                                  |
| • for signal "1", min.                    | max. 17.4 V                                      |
| Output current                            |                                                  |
| • for signal "0" residual current, max.   | 10 μA                                            |
| Parallel switching of 2 outputs           |                                                  |
| • for increased power                     | Yes                                              |
| • for redundant control of a load         | No                                               |
| Switching frequency                       |                                                  |
| • with resistive load, max.               | 30 Hz                                            |
| • with inductive load, max.               | 2 Hz                                             |
| Load resistance range                     |                                                  |
| • lower limit                             | 270 Ω                                            |
| • upper limit                             | 18 kΩ                                            |
| Cable length                              |                                                  |
| • Cable length, shielded, max.            | 500 m                                            |
| • Cable length unshielded, max.           | 500 m                                            |

| 6ES7 138-7FD00-0AB0                                                |                      |
|--------------------------------------------------------------------|----------------------|
| <b>Parameter</b>                                                   |                      |
| Diagnosis: wire break                                              | yes                  |
| Diagnosis: short circuit                                           | yes                  |
| <b>Alarms/diagnostics/status information</b>                       |                      |
| Status indicator                                                   | Yes                  |
| Substitute values connectable                                      | Yes                  |
| <b>Alarms</b>                                                      |                      |
| • Diagnostic alarm                                                 | Yes; Parameterizable |
| <b>Diagnostics</b>                                                 |                      |
| • Diagnostic information readable                                  | Yes                  |
| • Wire break                                                       | Yes                  |
| • Short circuit                                                    | Yes                  |
| <b>Diagnostic indication LED</b>                                   |                      |
| • Group error SF (red)                                             | Yes                  |
| • Status indicator digital output (green)                          | Yes                  |
| <b>Isolation</b>                                                   |                      |
| Isolation checked with                                             | 370 V for 1 min      |
| <b>Galvanic isolation</b>                                          |                      |
| Galvanic isolation digital outputs                                 |                      |
| • between the channels                                             | No                   |
| • between the channels and the backplane bus                       | Yes                  |
| • between the channels and the load voltage L+                     | Yes                  |
| <b>Permissible potential difference between different circuits</b> | 60 V DC/30 V AC      |

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Fail-safe electronic modules F digital output module

#### Technical specifications (continued)

| 6ES7 138-7FD00-0AB0                            |                                                                            | 6ES7 138-7FD00-0AB0          |          |
|------------------------------------------------|----------------------------------------------------------------------------|------------------------------|----------|
| <b>Standards, approvals, certificates</b>      |                                                                            | <b>Dimensions and weight</b> |          |
| CE mark                                        | Yes                                                                        | Dimensions                   |          |
| Type of protection acc. to EN 50020 (CENELEC)  | II 2 G (1) GD Ex ib[ia Ga][ia IIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb | • Width                      | 30 mm    |
| Type of protection acc. to KEMA                | 10 ATEX 0057                                                               | • Height                     | 129 mm   |
| Highest safety class achievable in safety mode |                                                                            | • Depth                      | 136.5 mm |
| • acc. to EN 954                               | Up to Cat. 4                                                               | Weight                       |          |
| • acc. to IEC 61508                            | SIL 3                                                                      | • Weight, approx.            | 285 g    |
| • Performance level acc. to EN ISO 13849-1     | PLe                                                                        |                              |          |

| Ordering data                                                                                                                                      | Order No.           | Order No. |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|
| <b>Digital output module</b>                                                                                                                       |                     |           |
| 4 F-DO Ex 17.4 V/40 mA                                                                                                                             | 6ES7 138-7FD00-0AB0 |           |
| <b>Terminal modules</b>                                                                                                                            |                     |           |
| <b>TM-EM/EM60S</b>                                                                                                                                 | 6ES7 193-7CA00-0AA0 |           |
| Terminal module E60S (screw-type terminal)                                                                                                         |                     |           |
| <b>TM-EM/EM60C</b>                                                                                                                                 | 6ES7 193-7CA10-0AA0 |           |
| Terminal module E60C (spring-loaded terminal)                                                                                                      |                     |           |
| <b>Accessories</b>                                                                                                                                 |                     |           |
| <b>ET 200iSP Manual</b>                                                                                                                            |                     |           |
| • German                                                                                                                                           | 6ES7 152-1AA00-8AA0 |           |
| • English                                                                                                                                          | 6ES7 152-1AA00-8BA0 |           |
| <b>Cable connector</b>                                                                                                                             |                     |           |
| PROFIBUS cable connector with active terminating resistor                                                                                          | 6ES7 972-0DA60-0XA0 |           |
| For RS 485-IS electric circuit; 1.5 Mbit/s                                                                                                         |                     |           |
| <b>RS 485-IS coupler</b>                                                                                                                           | 6ES7 972-0AC80-0XA0 |           |
| Isolating transformer for connection of PROFIBUS DP and PROFIBUS RS 485-IS                                                                         |                     |           |
| <b>Labeling sheet</b>                                                                                                                              |                     |           |
| DIN A4, perforated, each consisting of 10 sheets of 30 strips each, can be used for electronic modules, and 20 strips each, can be used for IM 151 |                     |           |
| • petrol                                                                                                                                           | 6ES7 193-7BH00-0AA0 |           |
| • red                                                                                                                                              | 6ES7 193-7BD00-0AA0 |           |
| • yellow                                                                                                                                           | 6ES7 193-7BB00-0AA0 |           |
| • light beige                                                                                                                                      | 6ES7 193-7BA00-0AA0 |           |
| <b>Labels, inscribed</b>                                                                                                                           |                     |           |
| Ordering unit: 1 set with 200 units each for slot numbering                                                                                        |                     |           |
| • 10 x slots 1 to 2                                                                                                                                | 8WA8 861-0AB        |           |
| • 5 x slots 1 to 40                                                                                                                                | 8WA8 861-0AC        |           |
| <b>Labels, not inscribed</b>                                                                                                                       |                     |           |
| Ordering unit: 1 set with 200 units each for slot numbering                                                                                        | 8WA8 848-2AY        |           |
| <b>Distributed Safety V5.4 programming tool</b>                                                                                                    |                     |           |
| Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S                                                       |                     |           |
| Requirements: STEP 7 V5.3 SP3 and higher                                                                                                           |                     |           |
| Floating License                                                                                                                                   | 6ES7 833-1FC02-0YA5 |           |
| Software Update Service (requires current software version)                                                                                        | 6ES7 833-1FC00-0YX2 |           |
| <b>S7 F Systems RT License</b>                                                                                                                     |                     |           |
| For processing safety-related user programs, for one AS 412F/FH, AS 414F/FH or AS 417F/FH                                                          | 6ES7 833-1CC00-6YX0 |           |

I: Subject to export regulations AL: N and ECCN: EAR99H

## Fail-safe electronic modules

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Order No.                                                | Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Order No.                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <b>S7 F Systems V6.1</b><br>Programming and configuring environment for creating and operating safety-related STEP 7 programs for an S7 400H-based target system, Floating License for 1 user, executable under Windows XP Prof SP2/SP3, Windows Server 2003 SP2<br>2 languages (German, English)<br>Type of delivery: Certificate of License as well as software and electronic documentation on CD                                                                                                                                                                                                                                                                               | <b>6ES7 833-1CC02-0YA5</b>                               | <b>SIMATIC Safety Matrix Editor V6.2</b><br>Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment<br>1 language (English), executes with Windows 2000 Professional or Windows XP Professional, single license for 1 installation<br>Type of supply: Certificate of License and authorization diskette; software and electronic documentation on CD                                                                                            | <b>6ES7 833-1SM42-0YA5</b>                               |
| <b>SIMATIC Safety Matrix Tool V6.2</b><br>Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment<br>Including SIMATIC Safety Matrix Viewer for SIMATIC PCS 7, for operation and monitoring of the Safety Matrix in a SIMATIC PCS 7 environment with several operator control levels<br>1 language (English), executes with Windows XP Professional,<br>Type of delivery: Certificate of License and authorization diskette for Safety Matrix Tool and Safety Matrix Viewer; software and electronic documentation on CD<br>Floating License for 1 installation<br>Floating License upgrade from V5.x/V6.x to V6.2 | <b>6ES7 833-1SM02-0YA5</b><br><b>6ES7 833-1SM02-0YE5</b> | <b>SIMATIC Safety Matrix Viewer V6.2 for SIMATIC PCS 7</b><br>Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several operator control levels<br>2 languages (English/German), runs under Windows 2000 Professional, Windows XP Professional, Windows 2003 Server<br>Type of delivery: Certificate of License and authorization diskette; software and electronic documentation on CD<br>Floating License for 1 installation<br>Floating License upgrade from V6.x to V6.2 | <b>6ES7 833-1SM62-0YA5</b><br><b>6ES7 833-1SM62-0YE5</b> |

J: Subject to export regulations AL: N and ECCN: EAR99S

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Fail-safe electronic modules F analog input module

#### Overview



- Analog inputs for fail-safe SIMATIC S7 systems
- Can be used in the distributed ET 200iSP I/O device with IM 152-1

The analog electronic module 4 F-AI Ex HART has the following properties:

- Suitable for the connection of encoders from the hazardous area
- 4 analog inputs 1-channel (SIL2/Cat.3/PLe) or 4 inputs 2-channel (SIL3/Category 4/PLe, with two 4 F-AI Ex HART modules)
- Electrical isolation between channels and the backplane bus
- Input ranges:
  - 0 to 20 mA
  - 4 to 20 mA
- Suitable for the following sensors:
  - 2-wire transducers
  - HART field devices
- Programmable diagnostics
- Programmable diagnostic interrupt
- Diagnostic buffer integrated in module
- HART communication (HART protocol versions 5, 6, 7)
- Firmware update
- Identification data I&M
- Can only be used in safety mode

#### Technical specifications

| 6ES7 138-7FA00-0AB0                                        |                                                       |
|------------------------------------------------------------|-------------------------------------------------------|
| <b>Supply voltages</b><br>Power supply to the transmitters |                                                       |
| • short-circuit proof                                      | Yes                                                   |
| • Supply current, max.                                     | 25 mA; Plus 4 mA per channel                          |
| <b>Current consumption</b><br>from supply voltage L+, max. | 490 mA; (int. power bus)                              |
| <b>Power losses</b><br>Power loss, typ.                    | 5.4 W; max.                                           |
| <b>Address area</b><br>Address space per module            |                                                       |
| • Address space per module, max.                           | 16 byte; 12 byte in the I area / 4 byte in the O area |
| <b>Analog inputs</b><br>Number of analog inputs            | 4                                                     |
| Cable length, shielded, max.                               | 500 m                                                 |
| Cycle time (all channels) max.                             | See data in manual                                    |
| Technical unit for temperature measurement adjustable      |                                                       |
| • Voltage                                                  | No                                                    |
| • Current                                                  | Yes                                                   |
| • Thermocouple                                             | No                                                    |
| • Resistance thermometer                                   | No                                                    |
| • Resistance                                               | No                                                    |
| Input ranges (rated values), currents                      |                                                       |
| • 4 to 20 mA                                               | Yes; and 0 to 20 mA                                   |
| <b>Analog value creation</b><br>Measurement principle      | integrating (Sigma-Delta)                             |

| 6ES7 138-7FA00-0AB0                                                    |                      |
|------------------------------------------------------------------------|----------------------|
| Integrations and conversion time/ resolution per channel               |                      |
| • Resolution with overrange (bit including sign), max.                 | 16 bit               |
| • Integration time, parameterizable                                    | Yes                  |
| • Interference voltage suppression for interference frequency f1 in Hz | 50 / 60 Hz           |
| Smoothing of measured values                                           |                      |
| • parameterizable                                                      | Yes; in 4 stages     |
| • Step: None                                                           | Yes; 1 x cycle time  |
| • Step: Low                                                            | Yes; 4 x cycle time  |
| • Step: Medium                                                         | Yes; 32 x cycle time |
| • Step: High                                                           | Yes; 64 x cycle time |
| <b>Encoder</b><br>Connection of signal encoders                        |                      |
| • for current measurement as 2-wire transducer                         | Yes                  |
| • burden of 2-wire transmitter, max.                                   | 750 Ω                |
| <b>Errors/accuracies</b><br>Linearity error (relative to input area)   | +/- 0.015 %          |
| Temperature error (relative to input area)                             | +/- 0.005 %/K        |
| Crosstalk between the inputs, min.                                     | -50 dB               |
| Repeat accuracy in settled status at 25 °C (relative to input area)    | +/- 0.015%           |

## Technical specifications (continued)

| 6ES7 138-7FA00-0AB0                                                                                |                      |
|----------------------------------------------------------------------------------------------------|----------------------|
| Operational limit in overall temperature range                                                     |                      |
| • Current, relative to input area                                                                  | +/- 0.35%            |
| Basic error limit (operational limit at 25 °C)                                                     |                      |
| • Current, relative to input area                                                                  | +/- 0.1 %            |
| Interference voltage suppression for $f = n \times (f_l \pm 1\%)$ , $f_l$ = interference frequency |                      |
| • Series mode interference (peak value of interference < rated value of input range), min.         | 40 dB                |
| • Common mode interference, min.                                                                   | 50 dB                |
| <b>Alarms/diagnostics/status information</b>                                                       |                      |
| Alarms                                                                                             |                      |
| • Diagnostic alarm                                                                                 | Yes; Parameterizable |
| Diagnostics                                                                                        |                      |
| • Diagnostic information readable                                                                  | Yes                  |
| • Wire break                                                                                       | Yes                  |
| • Short circuit                                                                                    | Yes                  |
| Diagnostic indication LED                                                                          |                      |
| • Group error SF (red)                                                                             | Yes                  |
| <b>Galvanic isolation</b>                                                                          |                      |
| Galvanic isolation analog inputs                                                                   |                      |
| • between the channels                                                                             | No                   |
| • between the channels and the backplane bus                                                       | Yes                  |
| • between the channels and the load voltage L+                                                     | Yes; Power bus       |

| 6ES7 138-7FA00-0AB0                                              |                                                                             |
|------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <b>Permissible potential difference</b> between the inputs (UCM) | 60 V DC / 30 V AC                                                           |
| <b>Standards, approvals, certificates</b>                        |                                                                             |
| CE mark                                                          | Yes                                                                         |
| Type of protection acc. to EN 50020 (CENELEC)                    | II 2 G (1) GD Ex ib[ia Ga][ia IIIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb |
| Type of protection acc. to KEMA                                  | 10 ATEX 0058                                                                |
| • acc. to EN 954                                                 | Cat. 3 (single-channel), Cat. 4 (two-channel)                               |
| • acc. to IEC 61508                                              | SIL 3                                                                       |
| • Performance level acc. to EN ISO 13849-1                       | PL e                                                                        |
| <b>Dimensions and weight</b>                                     |                                                                             |
| Dimensions                                                       |                                                                             |
| • Width                                                          | 30 mm                                                                       |
| • Height                                                         | 129 mm                                                                      |
| • Depth                                                          | 136.5 mm                                                                    |
| Weight                                                           |                                                                             |
| • Weight, approx.                                                | 299 g                                                                       |

## Ordering data

| Order No.                                                 |                     |
|-----------------------------------------------------------|---------------------|
| <b>F analog input module</b>                              |                     |
| 4 F-AI Ex HART                                            | 6ES7 138-7FA00-0AB0 |
| <b>Terminal modules</b>                                   |                     |
| <b>TM-EM/EM60S</b>                                        | 6ES7 193-7CA00-0AA0 |
| Terminal module E60S (screw-type terminal)                |                     |
| <b>TM-EM/EM60C</b>                                        | 6ES7 193-7CA10-0AA0 |
| Terminal module E60C (spring-loaded terminal)             |                     |
| <b>Accessories</b>                                        |                     |
| <b>ET 200iSP Manual</b>                                   |                     |
| • German                                                  | 6ES7 152-1AA00-8AA0 |
| • English                                                 | 6ES7 152-1AA00-8BA0 |
| <b>Cable connector</b>                                    |                     |
| PROFIBUS cable connector with active terminating resistor | 6ES7 972-0DA60-0XA0 |
| For RS 485-IS electric circuit; 1.5 Mbit/s                |                     |

| Order No.                                                                                                                                          |                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>RS 485-IS coupler</b>                                                                                                                           |                     |
| Isolating transformer for connection of PROFIBUS DP and PROFIBUS RS 485-IS                                                                         | 6ES7 972-0AC80-0XA0 |
| <b>Labeling sheet</b>                                                                                                                              |                     |
| DIN A4, perforated, each consisting of 10 sheets of 30 strips each, can be used for electronic modules, and 20 strips each, can be used for IM 151 |                     |
| • petrol                                                                                                                                           | 6ES7 193-7BH00-0AA0 |
| • red                                                                                                                                              | 6ES7 193-7BD00-0AA0 |
| • yellow                                                                                                                                           | 6ES7 193-7BB00-0AA0 |
| • light beige                                                                                                                                      | 6ES7 193-7BA00-0AA0 |
| <b>Labels, inscribed</b>                                                                                                                           |                     |
| Ordering unit: 1 set with 200 items each for slot numbering                                                                                        |                     |
| • 10 x slots 1 to 2                                                                                                                                | 8WA8 861-0AB        |
| • 5 x slots 1 to 40                                                                                                                                | 8WA8 861-0AC        |

I: Subject to export regulations AL: N and ECCN: EAR99H



# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Fail-safe electronic modules

#### F analog input module

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                        | Order No.                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Order No.                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <b>Labels, not inscribed</b><br>Ordering unit: 1 set with 200 units each for slot numbering                                                                                                                                                                                                                                                                                                          | <b>8WA8 848-2AY</b>                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                          |
| <b>Distributed Safety V5.4 programming tool</b><br>Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S<br>Requirements: STEP 7 V5.3 SP3 and higher<br>Floating License<br>Software Update Service (requires current software version)                                                                                                                       | <b>6ES7 833-1FC02-0YA5</b><br><b>6ES7 833-1FC00-0YX2</b> | <b>SIMATIC Safety Matrix Tool V6.2</b><br>Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment<br>Including SIMATIC Safety Matrix Viewer for SIMATIC PCS 7, for operation and monitoring of the Safety Matrix in a SIMATIC PCS 7 environment with several operator control levels<br>1 language (English), executes with Windows XP Professional,<br>Type of delivery: Certificate of License and authorization diskette for Safety Matrix Tool and Safety Matrix Viewer; software and electronic documentation on CD<br>Floating License for 1 installation J | <b>6ES7 833-1SM02-0YA5</b><br><b>6ES7 833-1SM02-0YE5</b> |
| <b>S7 F Systems RT License</b><br>For processing safety-related user programs, for one AS 412F/FH, AS 414F/FH or AS 417F/FH                                                                                                                                                                                                                                                                          | <b>6ES7 833-1CC00-6YX0</b>                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                          |
| <b>S7 F Systems V6.1</b><br>Programming and configuring environment for creating and operating safety-related STEP 7 programs for an S7 400H-based target system, Floating License for 1 user, executable under Windows XP Prof SP2/SP3, Windows Server 2003 SP2<br>2 languages (German, English)<br>Type of delivery: Certificate of License as well as software and electronic documentation on CD | <b>6ES7 833-1CC02-0YA5</b>                               | <b>SIMATIC Safety Matrix Editor V6.2</b><br>Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment<br>1 language (English), executes with Windows 2000 Professional or Windows XP Professional, single license for 1 installation<br>Type of supply: Certificate of License and authorization diskette; software and electronic documentation on CD                                                                                                                                                                                                               | <b>6ES7 833-1SM42-0YA5</b>                               |
|                                                                                                                                                                                                                                                                                                                                                                                                      |                                                          | <b>SIMATIC Safety Matrix Viewer V6.2 for SIMATIC PCS 7</b><br>Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several operator control levels<br>2 languages (English/German), runs under Windows 2000 Professional, Windows XP Professional, Windows 2003 Server<br>Type of delivery: Certificate of License and authorization diskette; software and electronic documentation on CD<br>Floating License for 1 installation J<br>Floating License upgrade from V6.x to V6.2 J                                                                                                                | <b>6ES7 833-1SM62-0YA5</b><br><b>6ES7 833-1SM62-0YE5</b> |

J: Subject to export regulations AL: N and ECCN: EAR99S

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### ET 200iSP watchdog module

#### Overview



- The watchdog module will be plugged onto the (to be ordered separately) associated terminal module (screw connection or spring-loaded connection).
- Modules can be replaced under potentially explosive conditions during runtime.

#### Technical specifications

| 6ES7 138-7BB00-0AB0                   |          |
|---------------------------------------|----------|
| <b>Supply voltages</b>                |          |
| Rated value                           |          |
| • permissible range, lower limit (DC) | 20.4 V   |
| • permissible range, upper limit (DC) | 28.8 V   |
| <b>Digital inputs</b>                 |          |
| Number of inputs                      | 0        |
| <b>Dimensions and weight</b>          |          |
| <b>Dimensions</b>                     |          |
| • Width                               | 30 mm    |
| • Height                              | 129 mm   |
| • Depth                               | 136,5 mm |

| Ordering data                                 | Order No.                  |
|-----------------------------------------------|----------------------------|
| <b>Watchdog module</b>                        | <b>6ES7 138-7BB00-0AB0</b> |
| <b>Terminal modules</b>                       |                            |
| <b>TM-EM/EM60S</b>                            | <b>6ES7 193-7CA00-0AA0</b> |
| Terminal module E60S (screw-type terminal)    |                            |
| <b>TM-EM/EM60C</b>                            | <b>6ES7 193-7CA10-0AA0</b> |
| Terminal module E60S (spring-loaded terminal) |                            |
| <b>Accessories</b>                            |                            |
| <b>ET 200iSP product manual</b>               |                            |
| • German                                      | <b>6ES7 152-1AA00-8AA0</b> |
| • English                                     | <b>6ES7 152-1AA00-8BA0</b> |

|                                                                                                                                                                                   |                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Connectors</b>                                                                                                                                                                 |                            |
| <b>PROFIBUS connector with active termination resistor</b><br>for RS485-IS circuit; 1.5 Mbit/s                                                                                    | <b>6ES7 972-0DA60-0XA0</b> |
| <b>RS 485-IS Coupler</b><br>Isolating transformer for coupling from PROFIBUS DP and PROFIBUS RS 485-IS                                                                            | <b>6ES7 972-0AC80-0XA0</b> |
| <b>Labeling sheet</b>                                                                                                                                                             |                            |
| DIN A4, perforated, each consisting of 10 sheets of 30 strips each, used for electronic modules and 20 strips, used for IM 151                                                    |                            |
| • petrol                                                                                                                                                                          | <b>6ES7 193-7BH00-0AA0</b> |
| • red                                                                                                                                                                             | <b>6ES7 193-7BD00-0AA0</b> |
| • yellow                                                                                                                                                                          | <b>6ES7 193-7BB00-0AA0</b> |
| • light beige                                                                                                                                                                     | <b>6ES7 193-7BA00-0AA0</b> |
| <b>Labels, inscribed</b>                                                                                                                                                          |                            |
| Ordering unit 1 set with 200 units each for slot numbering                                                                                                                        |                            |
| • 10 x slots 1 to 2                                                                                                                                                               | <b>8WA8 861-0AB</b>        |
| • 5 x slots 1 to 40                                                                                                                                                               | <b>8WA8 861-0AC</b>        |
| <b>Labels, blank</b>                                                                                                                                                              |                            |
| Ordering unit 1 set with 200 units each for slot numbering                                                                                                                        | <b>8WA8 848-2AY</b>        |
| <b>S7-300 mounting rail</b>                                                                                                                                                       |                            |
| Standard rail 585 mm                                                                                                                                                              | <b>6ES7 390-1AF85-0AA0</b> |
| Standard rail 885 mm                                                                                                                                                              | <b>6ES7 390-1AJ85-0AA0</b> |
| <b>Stainless steel enclosure IP66 for Ex-Zone 1 in protection class EEx e,</b>                                                                                                    |                            |
| Empty housing without installation of modules, for use in a gaseous area, IP65 (IP54 when using a breather gland)                                                                 |                            |
| • Wall housing 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable glands (41 units) and 2 rows of blanking plugs | <b>6DL2 804-0AD30</b>      |
| • Wall housing 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable glands (66 units)                              | <b>6DL2 804-0AD50</b>      |

I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### ET 200iSP watchdog module

#### Ordering data

#### Order No.

#### Order No.

Empty housing without installation of modules, for use in a gaseous area, IP65 (IP54 when using a breather gland)

- Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable glands (68 units) and 2 rows of blanking plugs
- Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable glands (111 units)

**6DL2 804-0AE30**

**6DL2 804-0AE50**

Empty housing without installation of modules, for use in a dusty area, IP65

- Wall housing 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable glands (41 units) and 2 rows of blanking plugs
- Wall housing 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable glands (66 units)
- Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable glands (68 units) and 2 rows of blanking plugs
- Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable glands (111 units)

**6DL2 804-0DD30**

**6DL2 804-0DD50**

**6DL2 804-0DE30**

**6DL2 804-0DE50**

Enclosure with installation of ET 200iSP modules for use in a gaseous area, IP65 (IP54 when using a breather gland), ET 200iSP components must be ordered separately

- Wall housing 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable glands (41 units) and 2 rows of blanking plugs

**6DL2 804-1AD30**

Enclosure with installation of ET 200iSP modules for use in a gaseous area, IP65 (IP54 when using a breather gland), ET 200iSP components must be ordered separately

- Wall housing 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable glands (66 units)
- Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable glands (68 units) and 2 rows of blanking plugs
- Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable glands (111 units)

**6DL2 804-1AD50**

**6DL2 804-1AE30**

**6DL2 804-1AE50**

Enclosure with installation of modules, for use in a dusty area, IP65, the ET 200iSP components must be ordered separately

- Wall housing 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable glands (41 units) and 2 rows of blanking plugs
- Wall housing 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable glands (66 units)
- Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable glands (68 units) and 2 rows of blanking plugs
- Wall housing 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable glands (111 units)

**6DL2 804-1DD30**

**6DL2 804-1DD50**

**6DL2 804-1DE30**

**6DL2 804-1DE50**

I: Subject to export regulations AL: N and ECCN: EAR99H

## Overview



- The spare module is plugged onto the relevant terminal module (to be ordered separately; screw-type or spring-loaded connection).
- Modules can be replaced under potentially explosive conditions during runtime.

## Technical specifications

| 6ES7 138-7AA00-0AA0                           |                      |
|-----------------------------------------------|----------------------|
| <b>Standards, approvals, certificates</b>     |                      |
| CE mark                                       | Yes                  |
| Type of protection acc. to EN 50020 (CENELEC) | II 2 G EEx ib IIC T4 |
| Test number KEMA                              | 04 ATEX 1251         |
| <b>Dimensions and weight</b>                  |                      |
| Dimensions and weight                         |                      |
| • Width                                       | 30 mm                |
| • Height                                      | 129 mm               |
| • Depth                                       | 136.5 mm             |
| Weight                                        |                      |
| • Weight, approx.                             | 180 g                |

|                                               | 6ES7 193-7CA00-0AA0 | 6ES7 193-7CA10-0AA0 | 6ES7 193-7CB00-0AA0                       |
|-----------------------------------------------|---------------------|---------------------|-------------------------------------------|
| <b>Standards, approvals, certificates</b>     |                     |                     |                                           |
| CE mark                                       | No                  | No                  | Yes                                       |
| Type of protection acc. to EN 50020 (CENELEC) | No                  | No                  | II 2 G and I M2 Ex deib IIC T4; Ex deib I |
| Test number KEMA                              | 04 ATEX 2242        | 04 ATEX 2242        | 07 ATEX 0205                              |
| <b>Dimensions and weight</b>                  |                     |                     |                                           |
| Dimensions and weight                         |                     |                     |                                           |
| • Width                                       | 60 mm               | 60 mm               | 60 mm                                     |
| • Height                                      | 190 mm              | 190 mm              | 190 mm                                    |
| • Depth                                       | 52 mm               | 52 mm               | 52 mm                                     |
| Weight                                        |                     |                     |                                           |
| • Weight, approx.                             | 275 g               | 275 g               | 340 g                                     |

## Ordering data

## Order No.

|                                                                                                                                |                     |
|--------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>Spare module</b>                                                                                                            | 6ES7 138-7AA00-0AA0 |
| <b>Terminal modules</b>                                                                                                        |                     |
| <b>TM-EM/EM 60S</b>                                                                                                            | 6ES7 193-7CA00-0AA0 |
| Terminal module E60S (screw-type terminal)                                                                                     |                     |
| <b>TM-EM/EM 60C</b>                                                                                                            | 6ES7 193-7CA10-0AA0 |
| Terminal module E60C (spring-loaded terminal)                                                                                  |                     |
| <b>TM-RM/RM 60S</b>                                                                                                            | 6ES7 193-7CB00-0AA0 |
| for accommodating digital output module 2 DO relay and spare modules; screw-type terminal                                      |                     |
| <b>Accessories</b>                                                                                                             |                     |
| <b>ET 200iSP manual</b>                                                                                                        |                     |
| • German                                                                                                                       | 6ES7 152-1AA00-8AA0 |
| • English                                                                                                                      | 6ES7 152-1AA00-8BA0 |
| <b>Connectors</b>                                                                                                              |                     |
| PROFIBUS connector with active terminating resistor                                                                            | 6ES7 972-0DA60-0XA0 |
| for RS 485-IS circuit; 1.5 Mbit/s                                                                                              |                     |
| <b>RS 485-IS coupler</b>                                                                                                       | 6ES7 972-0AC80-0XA0 |
| Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS                                                       |                     |
| <b>Labeling sheet</b>                                                                                                          |                     |
| DIN A4, perforated, each consisting of 10 sheets of 30 strips each, used for electronic modules and 20 strips, used for IM 151 |                     |
| • petrol                                                                                                                       | 6ES7 193-7BH00-0AA0 |
| • red                                                                                                                          | 6ES7 193-7BD00-0AA0 |
| • yellow                                                                                                                       | 6ES7 193-7BB00-0AA0 |
| • light beige                                                                                                                  | 6ES7 193-7BA00-0AA0 |
| <b>Labels, inscribed</b>                                                                                                       |                     |
| Ordering unit 1 set with 200 units each for slot numbering                                                                     |                     |
| • 10 x slots 1 to 2                                                                                                            | 8WA8 861-0AB        |
| • 5 x slots 1 to 40                                                                                                            | 8WA8 861-0AC        |
| <b>Labels, blank</b>                                                                                                           |                     |
| Ordering unit 1 set with 200 units each for slot numbering                                                                     | 8WA8 848-2AY        |
| <b>S7-300 mounting rails</b>                                                                                                   |                     |
| Standard rail 585 mm                                                                                                           | 6ES7 390-1AF85-0AA0 |
| Standard rail 885 mm                                                                                                           | 6ES7 390-1AJ85-0AA0 |

I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### Spare module

#### Ordering data

#### Order No.

#### Order No.

##### Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e

Empty enclosure without installation of modules, for use in a gaseous area, IP65 (IP54 when using a breather gland)

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (111 units)

**6DL2 804-0AD30**

**6DL2 804-0AD50**

**6DL2 804-0AE30**

**6DL2 804-0AE50**

Empty enclosure without installation of modules, for use in a dusty area, IP65

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (111 units)

**6DL2 804-0DD30**

**6DL2 804-0DD50**

**6DL2 804-0DE30**

**6DL2 804-0DE50**

Enclosure with installation of ET 200iSP modules for use in a gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a gaseous area, with 5 rows of M16 cable entries (111 units)

**6DL2 804-1AD30**

**6DL2 804-1AD50**

**6DL2 804-1AE30**

**6DL2 804-1AE50**

Enclosure with installation of modules, for use in a dusty area, IP65; the ET 200iSP components must be ordered separately

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in a dusty area, with 5 rows of M16 cable entries (111 units)

**6DL2 804-1DD30**

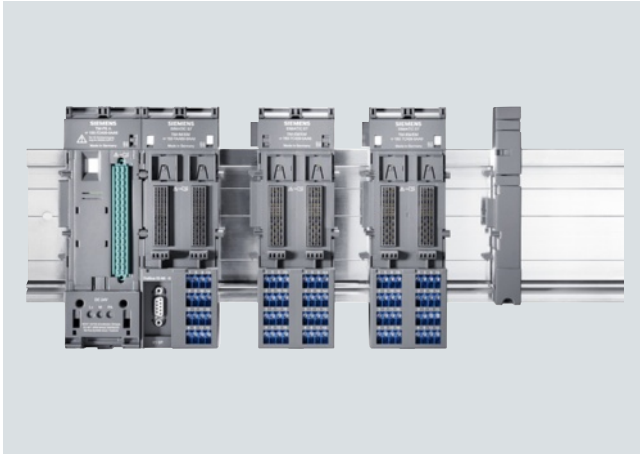
**6DL2 804-1DD50**

**6DL2 804-1DE30**

**6DL2 804-1DE50**

I: Subject to export regulations AL: N and ECCN: EAR99H

### Overview



- Mechanical modules for accommodating the power supply unit, interface and electronic modules
- For setting up the fixed wiring via self-assembling voltage buses
- Different versions for accommodating electronic modules
- Automatic encoding of the electronic modules
- Self-assembling shielding of the backplane bus for high data security
- Alternatively with screw or spring-loaded terminals

### Ordering data

#### TM-PS terminal modules

TM-PS A  
for accommodating a 24 V DC  
power supply

**6ES7 193-7DA10-0AA0**

TM-PS A UC  
for accommodating a  
110/230 V AC power supply

**6ES7 193-7DA20-0AA0**

TM-PS B  
for accommodating an additional,  
redundant 24 V DC power supply

**6ES7 193-7DB10-0AA0**

TM-PS B UC  
for accommodating an additional,  
redundant 110/230 V AC power  
supply

**6ES7 193-7DB20-0AA0**

#### TM-IM/xx terminal modules

TM-IM/EM60S  
for accommodating the IM152-1  
and an electronic module,  
including power termination  
module; screw terminals

**6ES7 193-7AA00-0AA0**

TM-IM/EM60S  
for accommodating the IM152-1  
and an electronic module,  
including power termination  
module; screw terminals, black

**6ES7 193-7AA20-0AA0**

TM-IM/EM60C  
for accommodating the IM152-1  
and an electronic module,  
including power termination  
module; spring-loaded terminals

**6ES7 193-7AA10-0AA0**

TM-IM/IM  
for accommodating two IM152-1  
modules in redundant mode,  
including power termination  
module

**6ES7 193-7AB00-0AA0**

#### TM-EM/EM terminal modules

TM-EM/EM60S  
for accommodating two electronic  
modules, screw terminals

**6ES7 193-7CA00-0AA0**

TM-EM/EM60S  
for accommodating two electronic  
modules, screw terminals, black

**6ES7 193-7CA20-0AA0**

TM-EM/EM60C  
for accommodating two electronic  
modules, spring-loaded terminals

**6ES7 193-7CA10-0AA0**

#### TM-RM/RM terminal module

TM-RM/RM  
for accommodating two relay  
modules, screw terminals

**6ES7 193-7CB00-0AA0**

I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200iSP

### RS 485-IS coupler

#### Overview



- Coupler for converting PROFIBUS DP into PROFIBUS RS485-IS intrinsically safe (protection type intrinsically safe i)
- Required for connecting intrinsically safe PROFIBUS DP stations (e.g. ET 200iS, ET 200iSP) and on all third-party devices that have an Ex i DP connection
- Additional use as a repeater in the hazardous area
- Acts as a safety barrier
- Passive bus node, configuration not required
- Certified according to ATEX 100a

#### Technical specifications

##### Technical specifications RS 485-IS Coupler

##### Dimensions and weight

|                           |                |
|---------------------------|----------------|
| Dimensions W x H x D (mm) | 80 x 125 x 130 |
| Weight                    | Approx. 500 g  |

##### Technical specifications – General

|                      |                     |
|----------------------|---------------------|
| Degree of protection | IP20                |
| Ambient temperature  | - 20 °C ... + 60 °C |

##### Standards and approvals

|                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• PROFIBUS</li> <li>• EU directive</li> <li>• CENELEC</li> <li>• UL and CSA</li> </ul> | IEC 61784-1: 2002 Ed1 CP 3/1<br>94/9/EG (ATEX 100a)<br>II 3 (2) G EEx nA[ib] IIC T4<br>Class I, Division2, Group A, B, C, D T4<br>Class I Zone 2, Group IIC T4<br>AIS Class I, Division 1, Group A, B, C, D<br>[Aexib] IIC, Class I, Zone1, 2, Group IIC<br>Class I, Division2, Group A, B, C, D T4<br>Class I Zone 2, Group IIC T4<br>AIS Class I, Division 1, Group A, B, C, D<br>[Aexib] IIC, Class I, Zone1, 2, Group IIC<br>IEC61131-2, Part 2<br>Conforming with 89/336/EEG<br>Conforming with 73/23/EEG<br>Classification companies <ul style="list-style-type: none"> <li>• ABS (American Bureau of Shipping)</li> <li>• BV (Bureau Veritas)</li> <li>• DNV (Det Norske Veritas)</li> <li>• GL (Germanischer Lloyd)</li> <li>• LRD (Lloyds Register of Shipping)</li> <li>• Class NK (Nippon Kaiji Kyokai)</li> </ul> |
| <ul style="list-style-type: none"> <li>• FM</li> </ul>                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>• IEC</li> <li>• CE</li> </ul>                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>• Ship-building certification</li> </ul>                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

##### Module-specific data

|                                                           |                                                          |
|-----------------------------------------------------------|----------------------------------------------------------|
| Data transmission rate on PROFIBUS DP, PROFIBUS RS 485-IS | 9.6; 19.2; 45.45; 93.75; 187.5; 500 kbit/s<br>1.5 Mbit/s |
| Bus protocol                                              | PROFIBUS DP                                              |

##### Voltages, currents, potentials

|                                                                                                                 |                           |
|-----------------------------------------------------------------------------------------------------------------|---------------------------|
| Nominal supply voltage for RS 485-IS coupler                                                                    | 24 V DC (20.4 ... 28.8 V) |
| <ul style="list-style-type: none"> <li>• Polarity reversal protection</li> <li>• Voltage drop bypass</li> </ul> | Yes<br>Min. 5 ms          |



**Technical specifications** (continued)**Technical specifications RS 485-IS Coupler**

Potential isolation for 24 V power supply

|                                          |                 |
|------------------------------------------|-----------------|
| • to PROFIBUS DP<br>- tested with        | Yes<br>500 V DC |
| • to PROFIBUS RS 485-IS<br>- tested with | Yes<br>500 V AC |

Current consumption RS 485-IS coupler (24 V DC), max. 150 mA

Power loss of the module, typically 3 Watts

**Status, alarms, diagnostics**

|                                                 |                  |
|-------------------------------------------------|------------------|
| Status display                                  | No               |
| Alarms                                          | None             |
| Diagnostic functions                            | Yes              |
| • Bus monitoring PROFIBUS DP (primary)          | Yellow LED "DP1" |
| • Bus monitoring PROFIBUS RS 485-IS (secondary) | Yellow LED "DP2" |
| • Monitoring 24 V power supply                  | Green LED "ON"   |

**Technical safety notice**

|           |                |
|-----------|----------------|
| $V_{DC}$  | $\pm 4.2$ V    |
| $I_{SC}$  | $\pm 93$ mA    |
| $P_0$     | 0.1 Watts      |
| $V_{max}$ | $\pm 4.2$ V    |
| $L_I$     | 0              |
| $C_i$     | 0              |
| $U_m$     | 250 V AC       |
| $T_a$     | -25 ... +60 °C |

**RS 485-IS segment**

|                                                         |                          |         |
|---------------------------------------------------------|--------------------------|---------|
| Permitted cable length on a single line                 | RS 485-IS                | DP Ex i |
| • 9.6 ... 187.5 kbit/s                                  | 1000 m                   | 200 m   |
| • 500 kbit/s                                            | 400 m                    | 200 m   |
| • 1.5 Mbit/s                                            | 200 m                    | 200 m   |
| Number of PROFIBUS DP nodes that can be connected, max. | 31                       | 16      |
| PROFIBUS RS 485-IS bus termination switch               | integrated, can be added |         |

**Ordering data****RS 485-IS coupler**

Isolating transformer for coupling PROFIBUS DP to PROFIBUS RS 485-IS

**Order No.****6ES7 972-0AC80-0XA0****Accessories****PROFIBUS cable connector with active terminating resistor**

for RS 485-IS electric circuit; 1.5 Mbit/s

**6ES7 972-0DA60-0XA0****PROFIBUS cable connector**

for the intrinsically safe PROFIBUS, 1.5 Mbit/s

**6ES7 972-0BA30-0XA0****Mounting rail**160 mm  
482 mm  
530 mm  
830 mm  
2000 mm**PROFIBUS Fast Connect bus cable**

Standard type with special design for quick mounting, 2-core, shielded, sold by the meter: max. delivery unit 1000 m, minimum order quantity 20 m

**Order No.****6ES7 390-1AB60-0AA0**  
**6ES7 390-1AE80-0AA0**  
**6ES7 390-1AF30-0AA0**  
**6ES7 390-1AJ30-0AA0**  
**6ES7 390-1BC00-0AA0**  
**6XV1 830-0EH10**

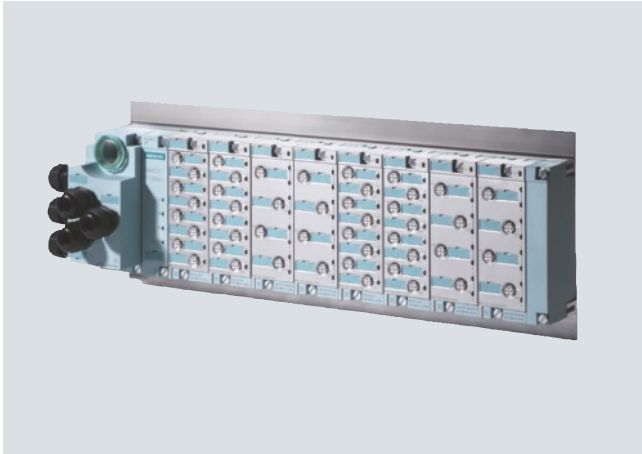


# SIMATIC ET 200 distributed I/O

## ET 200pro

### Introduction

#### Overview



- Distributed I/O system with degree of protection IP65/67 for cabinet-free use at the machine.
- Small, multifunctional complete solution: Digital inputs/outputs, fail-safe modules, motor starters up to 5.5 kW, etc.
- Communication over PROFIBUS or PROFINET
- Mixed arrangement of fail-safe and standard modules in the same station
- Freely selectable connection technique: Direct, ECOFAST or M12 7/8"
- Power module for easy implementation of load groups
- Module replacement during operation (hot swapping)
- Easy installation as well as permanent wiring
- Data transmission rates of up to 12 Mbit/s
- Extensive diagnostics: Module-specific or channel-specific
- Intelligent motor starters for starting and protection of motors and loads up to 5.5 kW
  - Versions: Direct and reversing starters - Standard and High-Feature
- Fail-safe modules with safety-related signal processing according to PROFIsafe

#### Technical specifications

##### General technical specifications

|                                                                                                             |                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electronic modules                                                                                          | <ul style="list-style-type: none"> <li>• Digital inputs/outputs</li> <li>• Analog inputs</li> <li>• Analog outputs</li> </ul>                                                                                                          |
| Motor starter                                                                                               |                                                                                                                                                                                                                                        |
| Cables and connections                                                                                      | M12 and M8 round connector with standard assignment for actuator/sensor                                                                                                                                                                |
| Transmission rate, max.                                                                                     | 12 Mbit/s (PROFIBUS DP), 100 Mbit/s (PROFINET IO)                                                                                                                                                                                      |
| Supply voltage                                                                                              | 24 V DC                                                                                                                                                                                                                                |
| Current consumption of one ET 200pro (internal and encoder supply, non-switched voltage), up to 55 °C, max. | ≤ 5 A                                                                                                                                                                                                                                  |
| Current consumption of one ET 200pro per infeed (IM, PM, switched voltage, up to 55 °C, max.)               | 10 A                                                                                                                                                                                                                                   |
| For overall configuration with looping through (several ET 200pro), up to 55 °C, max.                       | 16 A (with connecting module, directly)                                                                                                                                                                                                |
| Degree of protection                                                                                        | IP65/66/IP67 for interface, digital and analog modules                                                                                                                                                                                 |
| Material                                                                                                    | Thermoplastic (reinforced with glass fiber)                                                                                                                                                                                            |
| <b>Ambient conditions</b>                                                                                   |                                                                                                                                                                                                                                        |
| Temperature                                                                                                 | from 0 ... 55 °C (-25 °C on request)                                                                                                                                                                                                   |
| Relative humidity                                                                                           | from 5 ... 100%                                                                                                                                                                                                                        |
| Atmospheric pressure                                                                                        | from 795 ... 1080 hPa                                                                                                                                                                                                                  |
| <b>Mechanical stress</b>                                                                                    |                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>• Vibrations</li> </ul>                                              | Vibration test conforming to IEC 60068, Part 2-6 (sinusoidal) <ul style="list-style-type: none"> <li>• Constant acceleration 5 g, occasionally 10 g for interface, digital and analog modules</li> <li>• 2 g motor starters</li> </ul> |
| <ul style="list-style-type: none"> <li>• Shock</li> </ul>                                                   | Shock test according to IEC 680068 Part 2 - 27, half-sine, 30 g, 18 ms duration for interface, digital and analog modules <ul style="list-style-type: none"> <li>• 15 g, 11 ms duration for motor starters</li> </ul>                  |
| Approvals                                                                                                   | UL, CSA or cULus                                                                                                                                                                                                                       |

## Overview



Interface modules for handling communication between the ET 200pro and the higher-level master over PROFIBUS DP.

## Technical specifications

|                                                       | 6ES7 154-1AA01-0AB0          | 6ES7 154-2AA01-0AB0          |
|-------------------------------------------------------|------------------------------|------------------------------|
| <b>Supply voltages</b>                                |                              |                              |
| Supply voltage of electronics 1L+                     |                              |                              |
| • Rated value (DC)                                    | 24 V                         | 24 V                         |
| • Short-circuit protection                            | Yes; over exchangeable fuses | Yes; over exchangeable fuses |
| • Reverse polarity protection                         | Yes; against destruction     | Yes; against destruction     |
| Rated value                                           |                              |                              |
| • 24 V DC                                             | Yes                          | Yes                          |
| • Permissible range, lower limit (DC)                 | 20.4 V                       | 20.4 V                       |
| • Permissible range, upper limit (DC)                 | 28.8 V                       | 28.8 V                       |
| <b>Current consumption</b>                            |                              |                              |
| from supply voltage 1L+, max.                         | 200 mA                       | 200 mA                       |
| <b>Power losses</b>                                   |                              |                              |
| Power loss, typ.                                      | 5 W                          | 5 W                          |
| <b>Address area</b>                                   |                              |                              |
| Addressing volume                                     |                              |                              |
| • Outputs                                             | 244 byte                     | 244 byte                     |
| • Inputs                                              | 244 byte                     | 244 byte                     |
| <b>PROFIBUS DP</b>                                    |                              |                              |
| Automatic detection of transmission speed             | Yes                          | Yes                          |
| <b>1st interface</b>                                  |                              |                              |
| Type of interface                                     | PROFIBUS DP                  | PROFIBUS DP                  |
| Physics                                               | RS 485                       | RS 485                       |
| Functionality                                         |                              |                              |
| • DP slave                                            | Yes                          | Yes                          |
| DP slave                                              |                              |                              |
| • Services                                            |                              |                              |
| - SYNC/FREEZE                                         | Yes                          | Yes                          |
| - Direct data exchange (slave-to-slave communication) | Yes                          | Yes                          |
| • Transmission rate, min.                             | 9.6 kbit/s                   | 9.6 kbit/s                   |
| • Transmission rate, max.                             | 12 Mbit/s                    | 12 Mbit/s                    |
| <b>Parameter</b>                                      |                              |                              |
| DPV1 operation                                        | possible                     | possible                     |
| Process alarm                                         | parameterizable              | parameterizable              |
| Swapping interrupt                                    | parameterizable              | parameterizable              |
| Startup if setpoint not equal to actual configuration | parameterizable              | parameterizable              |

## SIMATIC ET 200 distributed I/O

## ET 200pro

Interface modules  
IM 154-1 and IM 154-2

## Technical specifications (continued)

|                                              | 6ES7 154-1AA01-0AB0 | 6ES7 154-2AA01-0AB0 |
|----------------------------------------------|---------------------|---------------------|
| <b>Alarms/diagnostics/status information</b> |                     |                     |
| Diagnostic indication LED                    |                     |                     |
| • Bus fault BF (red)                         | Yes                 | Yes                 |
| • Group error SF (red)                       | Yes                 | Yes                 |
| • Monitoring 24 V voltage supply ON (green)  | Yes                 | Yes                 |
| • Load voltage monitoring 24 V DC (green)    | Yes                 | Yes                 |
| <b>Isolation</b>                             |                     |                     |
| Isolation checked with                       | 500 V DC            | 500 V DC            |
| <b>Galvanic isolation</b>                    |                     |                     |
| between supply voltage and electronics       | Yes                 | Yes                 |
| <b>Environmental requirements</b>            |                     |                     |
| Operating temperature                        |                     |                     |
| • Min.                                       | -25 °C              | -25 °C              |
| • Max.                                       | 55 °C               | 55 °C               |
| Storage/transport temperature                |                     |                     |
| • Min.                                       | -40 °C              | -40 °C              |
| • Max.                                       | 70 °C               | 70 °C               |
| <b>Degree of protection</b>                  |                     |                     |
| IP67                                         | Yes                 | Yes                 |
| <b>General information</b>                   |                     |                     |
| Vendor identification (VendorID)             | 8118H               | 8119H               |
| <b>Dimensions and weight</b>                 |                     |                     |
| Dimensions                                   |                     |                     |
| • Width                                      | 90 mm               | 90 mm               |
| • Height                                     | 130 mm              | 130 mm              |
| • Depth                                      | 59.3 mm             | 59.3 mm             |
| Weight                                       |                     |                     |
| • Weight, approx.                            | 375 g               | 375 g               |

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| Ordering data                                                                                                                                                                   | Order No.                  |                                                                                                                                                                                                                                                                                                         | Order No.                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IM154-1 interface module</b><br>For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP                                                 | <b>6ES7 154-1AA01-0AB0</b> | <b>CM IM DP M12, 7/8" connection module</b><br>For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 x M12 and 2 x 7/8"                                                                                                                                                 | <b>6ES7 194-4AD00-0AA0</b>                                                                                                                                                                                                                                                                               |
| <b>IM154-2 High Feature interface module</b><br>For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP; support of PROFI-safe             | <b>6ES7 154-2AA01-0AB0</b> | <b>Accessories for CM IM DP ECOFAST</b>                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                          |
| <b>Accessories</b>                                                                                                                                                              |                            | <b>PROFIBUS ECOFAST hybrid cable, preassembled</b><br>With 2 ECOFAST connectors, trailing-type cable 2 x CU 0.64 mm <sup>2</sup> and 4 x Cu 1.5 mm <sup>2</sup>                                                                                                                                         |                                                                                                                                                                                                                                                                                                          |
| <b>CM IM DP ECOFAST connection module</b><br>For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 ECOFAST Cu connections                       | <b>6ES7 194-4AA00-0AA0</b> | <ul style="list-style-type: none"> <li>• 1.5 m long</li> <li>• 3.0 m long</li> <li>• 5.0 m long</li> <li>• 10 m long</li> <li>• 15 m long</li> <li>• 20 m long</li> <li>• 25 m long</li> <li>• 30 m long</li> <li>• 35 m long</li> <li>• 40 m long</li> <li>• 45 m long</li> <li>• 50 m long</li> </ul> | <b>6XV1 830-7BH15</b><br><b>6XV1 830-7BH30</b><br><b>6XV1 830-7BH50</b><br><b>6XV1 830-7BN10</b><br><b>6XV1 830-7BN15</b><br><b>6XV1 830-7BN20</b><br><b>6XV1 830-7BN25</b><br><b>6XV1 830-7BN30</b><br><b>6XV1 830-7BN35</b><br><b>6XV1 830-7BN40</b><br><b>6XV1 830-7BN45</b><br><b>6XV1 830-7BN50</b> |
| <b>CM IM DP direct connection module</b><br>For connecting PROFIBUS DP and the 24 V power supply directly to the PROFIBUS interface modules, up to six M20 screwed cable glands | <b>6ES7 194-4AC00-0AA0</b> |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                          |

I: Subject to export regulations AL: N and ECCN: EAR99H

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## ET 200pro

## Interface modules

### IM 154-1 and IM 154-2

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Order No.                                                                                                                                                                                                                                                                                                                                                                        | Order No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General accessories</b><br><b>ET 200pro rack</b> <ul style="list-style-type: none"> <li>Narrow, for interface, electronic and power modules               <ul style="list-style-type: none"> <li>500 mm</li> <li>1000 mm</li> <li>2000 mm, can be cut to length</li> </ul> </li> <li>Compact, for interface, electronics and power modules               <ul style="list-style-type: none"> <li>500 mm</li> <li>1000 mm</li> <li>2000 mm, can be cut to length</li> </ul> </li> <li>Wide, for interface, electronics, power modules and motor starters               <ul style="list-style-type: none"> <li>500 mm</li> <li>1000 mm</li> <li>2000 mm, can be cut to length</li> </ul> </li> <li>Wide, for I/O modules and motor starters               <ul style="list-style-type: none"> <li>500 mm</li> <li>1000 mm</li> <li>2000 mm</li> </ul> </li> </ul> | <b>6ES7 194-4GA00-0AA0</b><br><b>6ES7 194-4GA60-0AA0</b><br><b>6ES7 194-4GA20-0AA0</b><br><br><b>6ES7 194-4GC70-0AA0</b><br><b>6ES7 194-4GC60-0AA0</b><br><b>6ES7 194-4GC20-0AA0</b><br><br><b>6ES7 194-4GB00-0AA0</b><br><b>6ES7 194-4GB60-0AA0</b><br><b>6ES7 194-4GB20-0AA0</b><br><br><b>6ES7 194-4GD00-0AA0</b><br><b>6ES7 194-4GD10-0AA0</b><br><b>6ES7 194-4GD20-0AA0</b> | <b>PROFIBUS Fast Connect bus cable</b><br>Standard type with special design for fast assembly, 2-core, shielded, sold by the meter; max. length that can be supplied 1000 m, minimum order quantity 20 m<br><br><b>PROFIBUS Hybrid Standard Cable GP</b><br>Standard PROFIBUS hybrid cable with 2 energy cables (1.5 mm <sup>2</sup> ) for supplying data and energy for ET 200pro<br><br><b>Technical product data</b><br>For CAX applications, one-off license<br><br><b>SIMATIC Manual Collection</b><br>Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)<br><br><b>SIMATIC Manual Collection – Update service for 1 year</b><br>Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates |
| <b>Spare fuse</b><br>12.5 A quick-response, for interface and power modules, 10 items per package unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>6ES7 194-4HB00-0AA0</b>                                                                                                                                                                                                                                                                                                                                                       | <b>6XV1 830-0EH10</b><br><br><b>6XV1 860-2R</b><br><br><b>6ES7 991-0CD01-0YX0</b><br><br><b>6ES7 998-8XC01-8YE0</b><br><br><b>6ES7 998-8XC01-8YE2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

D: Subject to export regulations AL: N and ECCN: 5D992  
J: Subject to export regulations AL: N and ECCN: EAR99S

## Overview



Interface module for processing the communication between ET 200pro and a higher-level controller over PROFINET IO.

## Technical specifications

| 6ES7 154-4AB10-0AB0                       |                                                                                                                                            |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                    |                                                                                                                                            |
| Supply voltage of electronics 1L+         | 24 V                                                                                                                                       |
| • Rated value (DC)                        | Yes; fuse in lower part is exchangeable, the fuse on the IM-LP is not                                                                      |
| • Short-circuit protection                | Yes; against destruction                                                                                                                   |
| • Reverse polarity protection             |                                                                                                                                            |
| Rated value                               | Yes                                                                                                                                        |
| • 24 V DC                                 | 20.4 V; Unit [V]                                                                                                                           |
| • permissible range, lower limit (DC)     | 28.8 V; Unit [V]                                                                                                                           |
| • permissible range, upper limit (DC)     |                                                                                                                                            |
| <b>Current consumption</b>                |                                                                                                                                            |
| from backplane bus 3.3 V DC, max.         | Not applicable                                                                                                                             |
| from supply voltage 1L+, max.             | 400 mA; dependent on terminal module, typ. maximum value for FO connection method, full load on RWB and 20.4 V input voltage               |
| <b>Power losses</b>                       |                                                                                                                                            |
| Power loss, typ.                          | 6 W; dependent on terminal module, typ. maximum value for CU connection method, full load on RWB, for FO the value is approx. 0.7 W higher |
| <b>Memory</b>                             |                                                                                                                                            |
| Micro Memory Card                         | No; internal memory medium                                                                                                                 |
| <b>Address area</b>                       |                                                                                                                                            |
| Addressing volume                         |                                                                                                                                            |
| • Outputs                                 | 256 byte                                                                                                                                   |
| • Inputs                                  | 256 byte                                                                                                                                   |
| <b>Interfaces</b>                         |                                                                                                                                            |
| automatic detection of transmission speed | Yes                                                                                                                                        |
| <b>Protocols</b>                          |                                                                                                                                            |
| PROFINET IO                               | Yes                                                                                                                                        |

| 6ES7 154-4AB10-0AB0                                   |                                                               |
|-------------------------------------------------------|---------------------------------------------------------------|
| <b>PROFINET IO</b>                                    |                                                               |
| Transmission rate, max.                               | 100 Mbit/s                                                    |
| Services                                              | ARP, PING, SNMP                                               |
| <b>Parameter</b>                                      |                                                               |
| Diagnostic alarm                                      | 1                                                             |
| Process alarm                                         | 1                                                             |
| Swapping interrupt                                    | 1                                                             |
| identifier-related diagnostic data                    | 1                                                             |
| Module status                                         | 1                                                             |
| Channel-related diagnostics                           | 1                                                             |
| Startup if setpoint not equal to actual configuration | 1                                                             |
| Hot swapping of modules                               | 1                                                             |
| <b>Alarms/diagnostics/status information</b>          |                                                               |
| Diagnostic indication LED                             |                                                               |
| • Bus fault BF (red)                                  | Yes; additional LEDs (MAINT, P1/2 LINK, P1/2 RX/TX) available |
| • Group error SF (red)                                | Yes                                                           |
| • Monitoring 24 V voltage supply ON (green)           | Yes                                                           |
| • Load voltage monitoring DC 24 V (green)             | Yes                                                           |
| <b>Isolation</b>                                      |                                                               |
| Isolation checked with                                | 500 V DC                                                      |
| <b>Galvanic isolation</b>                             |                                                               |
| between backplane bus and electronics                 | No                                                            |
| between supply voltage and electronics                | Yes                                                           |

## SIMATIC ET 200 distributed I/O

## ET 200pro

Interface modules  
IM 154-4 PN

## Technical specifications (continued)

| 6ES7 154-4AB10-0AB0               |        |
|-----------------------------------|--------|
| <b>Environmental requirements</b> |        |
| Operating temperature             |        |
| • Min.                            | -25 °C |
| • max.                            | 55 °C  |
| Storage/transport temperature     |        |
| • Min.                            | -40 °C |
| • max.                            | 70 °C  |
| <b>Degree of protection</b>       |        |
| IP65                              | Yes    |
| IP66                              | Yes    |
| IP67                              | Yes    |

| 6ES7 154-4AB10-0AB0              |         |
|----------------------------------|---------|
| <b>General information</b>       |         |
| Vendor identification (VendorID) | 0x002A  |
| Device identifier (DeviceID)     | 0x0305  |
| <b>Dimensions and weight</b>     |         |
| Dimensions                       |         |
| • Width                          | 90 mm   |
| • Height                         | 130 mm  |
| • Depth                          | 59.3 mm |
| Weight                           |         |
| • Weight, approx.                | 490 g   |

| Ordering data                                                                                                                                                                                                                                                                           | Order No.                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                          | Order No.                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IM 154-4 PN High Feature interface module</b><br>For communication between ET 200pro and higher-level controllers over PROFINET IO; support of PROFIsafe                                                                                                                             | <b>6ES7 154-4AB10-0AB0</b>                                                                                                                                                                                                                                                                                                                                             | <b>7/8" sealing caps</b><br>1 pack = 10 units                                                                                                                                                                                                                                                                                                                                                                                            | <b>6ES7 194-3JA00-0AA0</b>                                                                                                                                                                                                                                                                  |
| <b>Accessories</b>                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                        | <b>7/8" connecting cable to power supply</b><br>5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, preassembled with two 7/8" connectors, 5-pin, up to 50 m                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                             |
| <b>CM IM PN connection module M12, 7/8"</b><br>For connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8"                                                                                                                                     | <b>6ES7 194-4AJ00-0AA0</b>                                                                                                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>1.5 m long</li> <li>2.0 m long</li> <li>3.0 m long</li> <li>5.0 m long</li> <li>10 m long</li> <li>15 m long</li> <li>Other special lengths with 90° or 180° cable outlet</li> </ul>                                                                                                                                                                                                              | <b>6XV1 822-5BH15</b><br><b>6XV1 822-5BH20</b><br><b>6XV1 822-5BH30</b><br><b>6XV1 822-5BH50</b><br><b>6XV1 822-5BN10</b><br><b>6XV1 822-5BN15</b><br>see <a href="http://support.automation.siemens.com/WW/view/en/26999294">http://support.automation.siemens.com/WW/view/en/26999294</a> |
| <b>CM IM PN connection module 2xRJ45</b><br>For connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x RJ45 and 2 x push-pull power connector                                                                                                                  | <b>6ES7 194-4AF00-0AA0</b>                                                                                                                                                                                                                                                                                                                                             | <b>Power line</b><br>5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m                                                                                                                                                                                                                                                                                      | <b>6XV1 830-8AH10</b>                                                                                                                                                                                                                                                                       |
| <b>CM IM PN 2xSCRJ FO connection module</b><br>For connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x SCRJ FO and 2 x push-pull power connector                                                                                                            | <b>6ES7 194-4AG00-0AA0</b>                                                                                                                                                                                                                                                                                                                                             | <b>7/8" cable connector</b><br>For ET 200eco, with axial cable outlet                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                             |
| <b>M12 sealing cap</b><br>For protection of unused M12 connections with ET 200pro                                                                                                                                                                                                       | <b>3RX9 802-0AA00</b>                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>with male insert, 5 per pack</li> <li>with female insert, 5 per pack</li> </ul>                                                                                                                                                                                                                                                                                                                   | <b>6GK1 905-0FA00</b><br><b>6GK1 905-0FB00</b>                                                                                                                                                                                                                                              |
| <b>IE M12 connecting cables</b><br>Preassembled, with two M12 connectors, up to 85 m                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                        | <b>Industrial Ethernet FastConnect installation cables</b>                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>0.3 m long</li> <li>0.5 m long</li> <li>1.0 m long</li> <li>1.5 m long</li> <li>2.0 m long</li> <li>3.0 m long</li> <li>5.0 m long</li> <li>10 m long</li> <li>15 m long</li> <li>Other special lengths with 90° or 180° cable outlet</li> </ul> | <b>6XV1 870-8AE30</b><br><b>6XV1 870-8AE50</b><br><b>6XV1 870-8AH10</b><br><b>6XV1 870-8AH15</b><br><b>6XV1 870-8AH20</b><br><b>6XV1 870-8AH30</b><br><b>6XV1 870-8AH50</b><br><b>6XV1 870-8AN10</b><br><b>6XV1 870-8AN15</b><br>see <a href="http://support.automation.siemens.com/WW/view/en/26999294">http://support.automation.siemens.com/WW/view/en/26999294</a> | <ul style="list-style-type: none"> <li><b>IE FC TP Standard Cable GP 2 x 2;</b><br/>Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m</li> <li><b>IE FC TP Trailing Cable 2 x 2;</b><br/>Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m</li> <li><b>IE FC TP Trailing Cable GP 2 x 2;</b><br/>Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m</li> </ul> | <b>6XV1 840-2AH10</b><br><br><b>6XV1 840-3AH10</b><br><br><b>6XV1 870-2D</b>                                                                                                                                                                                                                |

I: Subject to export regulations AL: N and ECCN: EAR99H



| Ordering data                                                                                                                                                                                                                                                                                                   | Order No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Order No.                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Industrial Ethernet FastConnect installation cables</b><br><b>• IE TP Torsion Cable GP 2 x 2;</b><br>Sold by the meter, max. order quantity 1000 m;<br>Minimum order quantity 20 m<br><b>• IE FC TP Marine Cable 2 x 2;</b><br>Sold by the meter, max. order quantity 1000 m;<br>Minimum order quantity 20 m | <b>6XV1 870-2F</b><br><br><b>6XV1 840-4AH10</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>IE RJ45 Plug PRO</b><br>RJ45 plug in IP65/67-rated design for on-site assembly, plastic housing, insulation/displacement connection system, for SCALANCE X-200IRT PRO and ET200pro:<br>1 pack = 1 unit                                                                                                       | <b>6GK1901-1BB10-6AA0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>IE SC RJ POF Plug PRO</b><br>SC RJ plug for POF fibers in IP65/67-rated design for on-site assembly, plastic housing, for SCALANCE X-200IRT PRO and ET200pro<br>1 pack = 1 unit                                                                                                                              | <b>6GK1900-0MB00-6AA0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>IE SC RJ PCF Plug PRO</b><br>SC RJ plug for PCF fibers in IP65/67-rated design for on-site assembly, plastic housing, for SCALANCE X-200IRT PRO<br>1 pack = 1 unit                                                                                                                                           | <b>6GK1900-0NB00-6AA0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Power Plug PRO</b><br>5-pole power plug for 2 x 24 V power supply in IP65/67-rated design, for on-site assembly, plastic housing, for SCALANCE X-200IRT and ET200 pro<br>1 pack = 1 unit                                                                                                                     | <b>6GK1907-0AB10-6AA0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>IE panel feedthrough</b><br>Control cabinet feedthrough for converting M12 D-coded connection system (IP65) to RJ45 connection system (IP20)<br>• 1 pack = 5 units                                                                                                                                           | <b>6GK1 901-0DM20-2AA5</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Push-Pull cable connector</b><br>For 1L+/ 2L+, unassembled                                                                                                                                                                                                                                                   | <b>6GK1 907-0AB10-6AA0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Cover caps for Push-Pull RJ45 female connectors</b><br>5 units per pack                                                                                                                                                                                                                                      | <b>6ES7 194-4JD50-0AA0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                 | <b>General accessories</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                 | <b>ET 200pro rack</b><br>• Narrow, for interface, electronics and power modules<br>- 500 mm<br>- 1000 mm<br>- 2000 mm, can be cut to length<br>• Compact, for interface, electronics and power modules<br>- 500 mm<br>- 1000 mm<br>- 2000 mm, can be cut to length<br>• Wide, for interface, electronics, power modules and motor starters<br>- 500 mm<br>- 1000 mm<br>- 2000 mm, can be cut to length<br>• Wide, for I/O modules and motor starters<br>- 500 mm<br>- 1000 mm<br>- 2000 mm | <b>6ES7 194-4GA00-0AA0</b><br><b>6ES7 194-4GA60-0AA0</b><br><b>6ES7 194-4GA20-0AA0</b><br><br><b>6ES7 194-4GC70-0AA0</b><br><b>6ES7 194-4GC60-0AA0</b><br><b>6ES7 194-4GC20-0AA0</b><br><br><b>6ES7 194-4GB00-0AA0</b><br><b>6ES7 194-4GB60-0AA0</b><br><b>6ES7 194-4GB20-0AA0</b><br><br><b>6ES7 194-4GD00-0AA0</b><br><b>6ES7 194-4GD10-0AA0</b><br><b>6ES7 194-4GD20-0AA0</b> |
|                                                                                                                                                                                                                                                                                                                 | <b>Spare fuse</b><br>12.5 A quick-response, for interface and power modules, 10 units per package unit                                                                                                                                                                                                                                                                                                                                                                                     | <b>6ES7 194-4HB00-0AA0</b>                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                 | <b>SIMATIC Manual Collection</b> J<br>Electronic manuals on DVD, multi-language:<br>S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)                                                                                                                                                                                           | <b>6ES7 998-8XC01-8YE0</b>                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                 | <b>SIMATIC Manual Collection – Update service for 1 year</b> D<br>Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates                                                                                                                                                                                                                                                                                                                                   | <b>6ES7 998-8XC01-8YE2</b>                                                                                                                                                                                                                                                                                                                                                       |

D: Subject to export regulations AL: N and ECCN: 5D992

I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S



# SIMATIC ET 200 distributed I/O

## ET 200pro

### Interface modules IM 154-6 PN IWLAN

#### Overview



Interface module for handling communication between ET 200pro and host PROFINET IO controllers over Industrial Wireless LAN (IWLAN) radio networks for 2.4 GHz or 5 GHz with data transfer rates up to 54 Mbit/s.

- Protection against illegal access, espionage, tapping and falsification through use of effective encryption mechanisms
- Fast exchange of devices through use of interchangeable medium MICRO MEMORY CARD

#### Technical specifications

| IM 154-6 PN IWLAN interface module                | 6ES7 154-6AB00-0AB0<br>6ES7 154-6AB50-0AB0                                                                                       | IM 154-6 PN IWLAN interface module                                      | 6ES7 154-6AB00-0AB0<br>6ES7 154-6AB50-0AB0                                                                                                                                             |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply voltage for electronic components 1L+      |                                                                                                                                  | • Radio frequency for WLAN in 2.4 GHz frequency band                    | 2.4 ... 2.4835 GHz                                                                                                                                                                     |
| • Rated value                                     | 24 V DC                                                                                                                          | • Radio frequency for WLAN in 5 GHz frequency band                      | 5.15 ... 5.825 GHz                                                                                                                                                                     |
| • Valid range, lower limit                        | 20.4 V DC                                                                                                                        | • Transmission method                                                   | Direct Sequence Spread Spectrum (DSSS)<br>Complementary Code Keying (CCK)                                                                                                              |
| • Valid range, upper limit                        | 28.8 V DC                                                                                                                        |                                                                         | Orthogonal Frequency Division Multiplexing (OFDM)                                                                                                                                      |
| • Short-circuit protection                        | Yes; replaceable fuse                                                                                                            | • Supported IWLAN services                                              | Current approvals can be found in the Internet at<br><a href="http://support.automation.siemens.com/WW/view/en/19812553">http://support.automation.siemens.com/WW/view/en/19812553</a> |
| • Reverse polarity protection                     | Yes; against destruction                                                                                                         |                                                                         |                                                                                                                                                                                        |
| • Max. infeed current                             | 5 A                                                                                                                              | • Connection for external antenna                                       |                                                                                                                                                                                        |
| Load voltage 2L+                                  |                                                                                                                                  | Parameters                                                              |                                                                                                                                                                                        |
| • Rated value (DC)                                | 24 V DC                                                                                                                          | • Diagnostic interrupt                                                  | Yes                                                                                                                                                                                    |
| • Lower limit of permissible range (DC)           | 20.4 V DC                                                                                                                        | • Maintenance alarm                                                     | Yes                                                                                                                                                                                    |
| • Upper limit of permissible range (DC)           | 28.8 V DC                                                                                                                        | • Hardware interrupt                                                    | Yes                                                                                                                                                                                    |
| • Short-circuit protection                        | Yes, for potential group                                                                                                         | • Swapping interrupt                                                    | Yes                                                                                                                                                                                    |
| • Reverse polarity protection                     | Yes; against destruction                                                                                                         | • Identifier-related diagnostic data                                    | Yes                                                                                                                                                                                    |
| • Max. infeed current                             | 8 A                                                                                                                              | • Module status                                                         | Yes                                                                                                                                                                                    |
| Current consumption from supply voltage 1L+, typ. | 335 mA                                                                                                                           | • Channel-specific diagnostics                                          | Yes                                                                                                                                                                                    |
| Power loss, typ.                                  | 8.5 W                                                                                                                            | • Start-up if preset configuration is not equal to actual configuration | Yes                                                                                                                                                                                    |
| Memory type                                       | Micro Memory Card, is required                                                                                                   | • Module replacement during operation                                   | Yes                                                                                                                                                                                    |
| Address range/address volume                      |                                                                                                                                  | Diagnostic indication (LED)                                             | Yes                                                                                                                                                                                    |
| • Outputs                                         | 256 byte                                                                                                                         | • Group fault (red)                                                     | Yes                                                                                                                                                                                    |
| • Inputs                                          | 256 byte                                                                                                                         | • Bus fault (red)                                                       | Yes                                                                                                                                                                                    |
| Reports                                           |                                                                                                                                  | • Maintenance information (yellow)                                      | Yes                                                                                                                                                                                    |
| • PROFINET IO                                     | Yes                                                                                                                              | • Monitoring 24 V power supply ON (green)                               | Yes                                                                                                                                                                                    |
| • Industrial Wireless LAN                         | Yes                                                                                                                              | • Load voltage monitoring 24 V DC (green)                               | Yes                                                                                                                                                                                    |
| PROFINET IO services                              | ARP, PING, SNMP                                                                                                                  | • Connection to an Access Point R1 LINK (green)                         | Yes                                                                                                                                                                                    |
| Industrial Wireless LAN                           |                                                                                                                                  | • Data exchange R1 RX/TX (yellow)                                       | Yes                                                                                                                                                                                    |
| • Transmission rate, max.                         | 54 Mbit/s                                                                                                                        | • Connection to a PG/PC (green)                                         | Yes                                                                                                                                                                                    |
| • Standards for wireless communication            | IEEE 802.11a<br>IEEE 802.11b<br>IEEE 802.11g<br>IEEE 802.11h (not valid for 6ES7 154-6AB50-0AB0)<br>IEEE 802.11e<br>IEEE 802.11i | • Data exchange with a PG/PC (yellow)                                   | Yes                                                                                                                                                                                    |

## Technical specifications (continued)

| IM 154-6 PN IWLAN interface module                         | 6ES7 154-6AB00-0AB0<br>6ES7 154-6AB50-0AB0 | IM 154-6 PN IWLAN interface module | 6ES7 154-6AB00-0AB0<br>6ES7 154-6AB50-0AB0 |
|------------------------------------------------------------|--------------------------------------------|------------------------------------|--------------------------------------------|
| Insulation tested at                                       | 500 V DC                                   | Storage/transport temperature      |                                            |
| Isolation                                                  |                                            | • Minimum                          | -40 °C                                     |
| • Between the backplane bus and supply voltage 1L+ and 2L+ | Yes                                        | • Maximum                          | 70 °C                                      |
| • Between Ethernet and supply voltage 1L+ and 2L+          | Yes                                        | Degree of protection               | IP65, IP66, IP67                           |
| • Between the supply voltage and electronic components     | Yes                                        | General information                |                                            |
| Operating temperature                                      |                                            | • Manufacturer's code (VendorID)   | 0x002A                                     |
| • Minimum                                                  | -25 °C                                     | • Device ID                        | 0x0305                                     |
| • Maximum                                                  | 55 °C                                      | Dimensions                         |                                            |
|                                                            |                                            | • Width                            | 135 mm                                     |
|                                                            |                                            | • Height                           | 130 mm                                     |
|                                                            |                                            | • Depth                            | 60 mm                                      |
|                                                            |                                            | Weight, approx.                    | 1085 g                                     |

| Ordering data                                                                                                                      | Order No.                  |                                                                                                                                | Order No.                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>IM 154-6 PN HF IWLAN interface module</b>                                                                                       |                            | <b>Accessories</b>                                                                                                             |                                                                                                                                       |
| For communication between ET 200pro and host controllers over Industrial Wireless LAN (IWLAN) radio networks; support of PROFIsafe |                            | <b>7/8" connecting cable to power supply</b>                                                                                   |                                                                                                                                       |
| With various national approvals; refer to the current list of approvals                                                            | <b>6ES7 154-6AB00-0AB0</b> | 5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, pre-assembled with two 7/8" connectors                                        |                                                                                                                                       |
| With approval for USA                                                                                                              | <b>6ES7 154-6AB50-0AB0</b> | 1.5 m long                                                                                                                     | <b>6XV1 822-5BH15</b>                                                                                                                 |
| <b>Antennas with omnidirectional characteristic</b>                                                                                |                            | 2.0 m long                                                                                                                     | <b>6XV1 822-5BH20</b>                                                                                                                 |
| Mounting directly on IM154-6 PN HF IWLAN                                                                                           |                            | 3.0 m long                                                                                                                     | <b>6XV1 822-5BH30</b>                                                                                                                 |
| • ANT IM 154-6 IWLAN; 2 units                                                                                                      | <b>6ES7 194-4MA00-0AA0</b> | 5.0 m long                                                                                                                     | <b>6XV1 822-5BH50</b>                                                                                                                 |
| For wall or pipe mounting                                                                                                          |                            | 10 m long                                                                                                                      | <b>6XV1 822-5BN10</b>                                                                                                                 |
| • ANT 792-6MN; rod antenna N-Connect female 2.4 GHz; 1 unit                                                                        | <b>6GK5 792-6MN00-0AA6</b> | 15 m long                                                                                                                      | <b>6XV1 822-5BN15</b>                                                                                                                 |
| • ANT793-6MN; rod antenna N-Connect female 5 GHz; 1 unit                                                                           | <b>6GK5 793-6MN00-0AA6</b> | • Other special lengths with 90° or 180° cable outlet                                                                          | See <a href="http://support.automation.siemens.com/WW/view/en/26999294">http://support.automation.siemens.com/WW/view/en/26999294</a> |
| For use with the RCoax antenna system                                                                                              |                            | <b>Power line</b>                                                                                                              | <b>6XV1 830-8AH10</b>                                                                                                                 |
| • ANT 792-4DN; RCoax N-Connect female 2.4 GHz; 1 unit                                                                              | <b>6GK5 792-4DN00-0AA6</b> | 5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m |                                                                                                                                       |
| • ANT793-4MN; RCoax N-Connect female 5 GHz; 1 unit                                                                                 | <b>6GK 5793-4MN00-0AA6</b> | <b>7/8" cable connector</b>                                                                                                    | <b>6GK1 905-0FB00</b>                                                                                                                 |
| <b>Antenna cables IWLAN RCoax; N-Connect / R-SMA</b>                                                                               |                            | For ET 200eco, with axial cable outlet; with socket insert, pack of 5                                                          |                                                                                                                                       |
| 1 m long                                                                                                                           | <b>6XV1 875-5CH10</b>      | <b>Twisted Pair cables 4x2 with RJ45 connectors</b>                                                                            |                                                                                                                                       |
| 2 m long                                                                                                                           | <b>6XV1 875-5CH20</b>      | 0.5 m long                                                                                                                     | <b>6XV1 870-3QE50</b>                                                                                                                 |
| 5 m long                                                                                                                           | <b>6XV1 875-5CH50</b>      | 1 m long                                                                                                                       | <b>6XV1 870-3QH10</b>                                                                                                                 |
| 10 m long                                                                                                                          | <b>6XV1 875-5CN10</b>      | 2 m long                                                                                                                       | <b>6XV1 870-3QH20</b>                                                                                                                 |
| IWLAN terminating resistor 50 Ohm for second R-SMA antenna socket, 3 units                                                         | <b>6GK5 795-1TR10-0AA6</b> | 6 m long                                                                                                                       | <b>6XV1 870-3QH60</b>                                                                                                                 |
|                                                                                                                                    |                            | 10 m long                                                                                                                      | <b>6XV1 870-3QN10</b>                                                                                                                 |

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## SIMATIC ET 200 distributed I/O

## ET 200pro

Interface modules  
IM 154-6 PN IWLAN

## Ordering data Order No. Order No. (continued)

**Crossed Twisted Pair cables  
4x2 with RJ45 connectors**

0.5 m long

**6XV1 870-3RE50**

1 m long

**6XV1 870-3RH10**

2 m long

**6XV1 870-3RH20**

6 m long

**6XV1 870-3RH60**

10 m long

**6XV1 870-3RN10****IE FC RJ45 Plug 180**

180° cable outlet; for line components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units

**6GK1 901-1BB10-2AA0**  
**6GK1 901-1BB10-2AB0**
**IE FC RJ45 Plug 90**

90° cable outlet; e.g. for ET 200S

- 1 pack = 1 unit
- 1 pack = 10 units

**6GK1 901-1BB20-2AA0**  
**6GK1 901-1BB20-2AB0**
**General accessories****ET 200pro rack**

- Narrow, for interface, electronics and power modules
  - 500 mm
  - 1000 mm
  - 2000 mm, can be cut to length
- Compact, for interface, electronics and power modules
  - 500 mm
  - 1000 mm
  - 2000 mm, can be cut to length
- Wide, for interface, electronics, power modules and motor starters
  - 500 mm
  - 1000 mm
  - 2000 mm, can be cut to length
- Wide, for I/O modules and motor starters
  - 500 mm
  - 1000 mm
  - 2000 mm

**6ES7 194-4GA00-0AA0**  
**6ES7 194-4GA60-0AA0**  
**6ES7 194-4GA20-0AA0**
**6ES7 194-4GC70-0AA0**  
**6ES7 194-4GC60-0AA0**  
**6ES7 194-4GC20-0AA0**
**6ES7 194-4GB00-0AA0**  
**6ES7 194-4GB60-0AA0**  
**6ES7 194-4GB20-0AA0**
**6ES7 194-4GD00-0AA0**  
**6ES7 194-4GD10-0AA0**  
**6ES7 194-4GD20-0AA0**
**Spare fuse**

12.5 A quick-response, for interface and power modules, 10 units per package unit

**6ES7 194-4HB00-0AA0****Labels**

20 x 7 mm, pale turquoise, 340 units per pack

**3RT1 900-1SB20****SIMATIC Micro Memory Card**

- 64 KB
- 128 KB
- 512 KB

**6ES7 953-8LF20-0AA0**  
**6ES7 953-8LG20-0AA0**  
**6ES7 953-8LJ20-0AA0**
**SIMATIC Manual Collection**

Electronic manuals on DVD, multi-language:  
S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)

**6ES7 998-8XC01-8YE0****SIMATIC Manual Collection – Update service for 1 year**

Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates

**6ES7 998-8XC01-8YE2**

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

## Overview



- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
  - Interface module for exchanging pre-processed I/O data between the ET 200pro and a higher-level master/IO controller via PROFIBUS DP/PROFINET IO
  - PROFINET IO controller to operate distributed I/Os on PROFINET
  - Component based Automation (CBA) on PROFINET
  - PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
  - PROFINET interface with 3-port switch
  - Isochronous mode on PROFIBUS or PROFINET
  - Integral Web server with the option of creating user-defined Web sites
  - CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
  - Interface module to exchange preprocessed I/O data from ET 200pro with a higher-level master through PROFIBUS DP
  - Fast, simple and end-to-end programming of a system with modular programs via STEP 7
  - Fail-safe IM 154-8F PN/DP CPU PROFIsafe available
- Micro Memory Card required for operation of CPU.

## Technical specifications

| 6ES7 154-8AB01-0AB0                                                              |                                                                                                   |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>Product version</b><br>associated programming package                         | STEP7 V 5.5 or higher                                                                             |
| <b>Supply voltages</b><br>external protection for supply cables (recommendation) | MCB 24 V DC / 16A with tripping I/O controller characteristic Type B and C (see ET 200pro manual) |
| <b>Current consumption</b><br>Current consumption (rated value)                  | 350 mA; typical                                                                                   |
| Current consumption (in no-load operation), typ.                                 | 250 mA; Typical, current consumption for CPU in STOP state                                        |
| Inrush current, typ.                                                             | 2 A; typical                                                                                      |
| $I^2t$                                                                           | 0.25 A <sup>2</sup> ·s; typical                                                                   |
| <b>Power losses</b><br>Power loss, typ.                                          | 8.5 W; typical                                                                                    |
| <b>Memory</b><br>Work memory<br>• integrated<br>• expandable                     | 384 Kibyte<br>No                                                                                  |
| Load memory<br>• pluggable (MMC)<br>• pluggable (MMC), max.                      | Yes<br>8 Mbyte                                                                                    |
| Backup<br>• present                                                              | Yes; ensured by MMC (maintenance-free)                                                            |
| • without battery                                                                | Yes; program and data                                                                             |
| <b>CPU-blocks</b><br>DB<br>• Number, max.<br>• Size, max.                        | 1 024; Number range: 1 to 16,000<br>64 Kibyte                                                     |

| 6ES7 154-8AB01-0AB0                                                                                                                                                                                          |                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| <b>FB</b><br>• Number, max.<br>• Size, max.                                                                                                                                                                  | 1 024; Number range: 0 to 7,999<br>64 Kibyte      |
| <b>FC</b><br>• Number, max.<br>• Size, max.                                                                                                                                                                  | 1 024; Number range: 0 to 7,999<br>64 Kibyte      |
| <b>OB</b><br>• Size, max.                                                                                                                                                                                    | 64 Kibyte                                         |
| <b>Nesting depth</b><br>• per priority class<br>• additional within an error OB                                                                                                                              | 16<br>4                                           |
| <b>CPU processing times</b><br>for bit operations, min.                                                                                                                                                      | 0.05 µs                                           |
| for word operations, min.                                                                                                                                                                                    | 0.09 µs                                           |
| for fixed point arithmetic, min.                                                                                                                                                                             | 0.12 µs                                           |
| for floating point arithmetic, min.                                                                                                                                                                          | 0.45 µs                                           |
| <b>Counters, timers and their retentivity</b><br>S7 counter<br>• Number<br>• Retentivity<br>- adjusted<br>- lower limit<br>- upper limit<br>• Counting range<br>- adjusted<br>- lower limit<br>- upper limit | 256<br><br>Yes<br>0<br>255<br><br>Yes<br>0<br>999 |

## SIMATIC ET 200 distributed I/O

## ET 200pro

Interface modules  
IM 154-8 PN/DP CPU

## Technical specifications (continued)

| 6ES7 154-8AB01-0AB0                     |                                                                                |
|-----------------------------------------|--------------------------------------------------------------------------------|
| IEC counter                             |                                                                                |
| • present                               | Yes                                                                            |
| • Type                                  | SFB                                                                            |
| S7 times                                |                                                                                |
| • Number                                | 256                                                                            |
| • Retentivity                           |                                                                                |
| - adjusted                              | Yes                                                                            |
| - lower limit                           | 0                                                                              |
| - upper limit                           | 255                                                                            |
| - preset                                | No retentivity                                                                 |
| • Time range                            |                                                                                |
| - lower limit                           | 10 ms                                                                          |
| - upper limit                           | 9 990 s                                                                        |
| IEC timer                               |                                                                                |
| • present                               | Yes                                                                            |
| • Type                                  | SFB                                                                            |
| • Number                                | Unlimited<br>(limited only by RAM capacity)                                    |
| <b>Data areas and their retentivity</b> |                                                                                |
| Flag                                    |                                                                                |
| • Number, max.                          | 2 048 byte                                                                     |
| • Retentivity available                 | Yes; MB 0 to MB 2047                                                           |
| • Number of clock memories              | 8                                                                              |
| Data blocks                             |                                                                                |
| • Number, max.                          | 1 024; Number range:<br>1 to 16,000                                            |
| • Size, max.                            | 64 Kibyte                                                                      |
| • Retentivity adjustable                | Yes; via non-retain property on<br>DB                                          |
| • Retentivity preset                    | yes                                                                            |
| Local data                              |                                                                                |
| • per priority class, max.              | 32 768 byte; 2048 byte max. per<br>block                                       |
| <b>Address area</b>                     |                                                                                |
| I/O address area                        |                                                                                |
| • overall                               | 2 048 byte                                                                     |
| • Outputs                               | 2 048 byte                                                                     |
| • of which, distributed                 |                                                                                |
| - Inputs                                | 2 048 byte                                                                     |
| - Outputs                               | 2 048 byte                                                                     |
| Process image                           |                                                                                |
| • Inputs, adjustable                    | 2 048 byte                                                                     |
| • Outputs, adjustable                   | 2 048 byte                                                                     |
| • Inputs, preset                        | 128 byte                                                                       |
| • Outputs, preset                       | 128 byte                                                                       |
| Subprocess images                       |                                                                                |
| • Number of subprocess images,<br>max.  | 1; With PROFINET IO, the length<br>of the user data is limited to<br>1600 byte |
| Digital channels                        |                                                                                |
| • Inputs                                | 16 384                                                                         |
| • Outputs                               | 16 384                                                                         |
| • Inputs, of which central              | 128                                                                            |
| • Outputs, of which central             | 64                                                                             |
| Analog channels                         |                                                                                |
| • Inputs                                | 1 024                                                                          |
| • Outputs                               | 1 024                                                                          |
| • Inputs, of which central              | 64                                                                             |
| • Outputs, of which central             | 64                                                                             |

| 6ES7 154-8AB01-0AB0                                     |                                                                                          |
|---------------------------------------------------------|------------------------------------------------------------------------------------------|
| <b>Hardware configuration</b>                           |                                                                                          |
| Racks, max.                                             | 1                                                                                        |
| Modules per rack, max.                                  | 16; expansion width max. 1m                                                              |
| Number of DP masters                                    |                                                                                          |
| • integrated                                            | 1                                                                                        |
| <b>Time</b>                                             |                                                                                          |
| Clock                                                   |                                                                                          |
| • Hardware clock (real-time clock)                      | Yes                                                                                      |
| • battery-backed and synchro-<br>nizable                | Yes                                                                                      |
| • Deviation per day, max.                               | 10 s; typ.: 2 s                                                                          |
| Runtime meter                                           |                                                                                          |
| • Number                                                | 1                                                                                        |
| • Number/Number range                                   | 0                                                                                        |
| • Range of values                                       | 0 to 2 <sup>31</sup> hours<br>(when using SFC 101)                                       |
| • Granularity                                           | 1 h                                                                                      |
| • Retentive                                             | Yes; must be restarted at each<br>restart                                                |
| Clock synchronization                                   |                                                                                          |
| • supported                                             | Yes                                                                                      |
| • to MPI, master                                        | Yes                                                                                      |
| • to MPI, slave                                         | Yes                                                                                      |
| • to DP, master                                         | Yes; with DP slave only slave<br>clock                                                   |
| • to DP, slave                                          | Yes                                                                                      |
| • on Ethernet via NTP                                   | Yes; as client                                                                           |
| <b>S7 message functions</b>                             |                                                                                          |
| Number of login stations for<br>message functions, max. | 16; depending on the connec-<br>tions configured for PG/OP and<br>S7 basic communication |
| Process diagnostic messages                             | Yes                                                                                      |
| simultaneously active Alarm-S<br>blocks, max.           | 300                                                                                      |
| <b>Test commissioning functions</b>                     |                                                                                          |
| Status/control                                          |                                                                                          |
| • Status/control variable                               | Yes                                                                                      |
| • Variables                                             | Inputs, outputs, memory bits, DB,<br>times, counters                                     |
| • Number of variables, max.                             | 30                                                                                       |
| • of which status variables, max.                       | 30                                                                                       |
| • of which control variables, max.                      | 14                                                                                       |
| Forcing                                                 |                                                                                          |
| • Forcing                                               | Yes                                                                                      |
| Status block                                            | Yes; up to 2 simultaneously                                                              |
| Single step                                             | Yes                                                                                      |
| Number of breakpoints                                   | 4                                                                                        |
| Diagnostic buffer                                       |                                                                                          |
| • present                                               | Yes                                                                                      |
| • Number of entries, max.                               | 500; only the last 100 entries<br>are retentive at power on/off                          |
| - adjusted                                              | No                                                                                       |
| - preset                                                | 10                                                                                       |

## Technical specifications (continued)

| 6ES7 154-8AB01-0AB0                                                  |                                                                                                         |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>Monitoring functions</b>                                          |                                                                                                         |
| Status LEDs                                                          | Yes                                                                                                     |
| <b>Communication functions</b>                                       |                                                                                                         |
| PG/OP communication                                                  | Yes                                                                                                     |
| Routing                                                              | Yes                                                                                                     |
| Global data communication                                            |                                                                                                         |
| • supported                                                          | Yes                                                                                                     |
| • Size of GD packets, max.                                           | 22 byte                                                                                                 |
| S7 basic communication                                               |                                                                                                         |
| • supported                                                          | Yes                                                                                                     |
| S7 communication                                                     |                                                                                                         |
| • supported                                                          | Yes                                                                                                     |
| Web server                                                           |                                                                                                         |
| • supported                                                          | Yes                                                                                                     |
| • Number of HTTP clients                                             | 5                                                                                                       |
| • User-defined websites                                              | Yes                                                                                                     |
| Open IE communication                                                |                                                                                                         |
| • TCP/IP                                                             | Yes; Via integrated PROFINET interface and loadable FBs                                                 |
| - Number of connections, max.                                        | 8                                                                                                       |
| - Data length, max.                                                  | 32 768 byte; 1460 byte with connection type 01H; 32768 byte with connection type 11H                    |
| - Several passive connections per port, supported                    | Yes                                                                                                     |
| • ISO-on-TCP (RFC1006)                                               | Yes                                                                                                     |
| - Number of connections, max.                                        | 8                                                                                                       |
| - Data length, max.                                                  | 32 768 byte                                                                                             |
| • UDP                                                                | Yes                                                                                                     |
| - Number of connections, max.                                        | 8                                                                                                       |
| - Data length, max.                                                  | 1 472 byte                                                                                              |
| Number of connections                                                |                                                                                                         |
| • overall                                                            | 16                                                                                                      |
| • usable for PG communication                                        | 15                                                                                                      |
| • usable for OP communication                                        | 15                                                                                                      |
| • usable for S7 basic communication                                  | 14                                                                                                      |
| • usable for routing                                                 | X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: 24 max. |
| PROFINET CBA (at set setpoint communication load)                    |                                                                                                         |
| • Setpoint for the CPU communication load                            | 50 %                                                                                                    |
| • Number of remote interconnection partners                          | 32                                                                                                      |
| • Number of functions, master/slave                                  | 30                                                                                                      |
| • Total of all Master/Slave connections                              | 1 000                                                                                                   |
| • Data length of all incoming connections master/slave, max.         | 4 000 byte                                                                                              |
| • Data length of all outgoing connections master/slave, max.         | 4 000 byte                                                                                              |
| • Number of device-internal and PROFIBUS interconnections            | 500                                                                                                     |
| • Data length of device-internal und PROFIBUS interconnections, max. | 4 000 byte                                                                                              |
| • Data length per connection, max.                                   | 1 400 byte                                                                                              |

| 6ES7 154-8AB01-0AB0                                                  |                                                    |
|----------------------------------------------------------------------|----------------------------------------------------|
| • Remote interconnections with acyclic transmission                  |                                                    |
| - Sampling frequency: Sampling time, min.                            | 500 ms                                             |
| - Number of incoming interconnections                                | 100                                                |
| - Number of outgoing interconnections                                | 100                                                |
| - Data length of all incoming interconnections, max.                 | 2 000 byte                                         |
| - Data length of all outgoing interconnections, max.                 | 2 000 byte                                         |
| - Data length per connection, max.                                   | 1 400 byte                                         |
| • Remote interconnections with cyclic transmission                   |                                                    |
| - Transmission frequency: Transmission interval, min.                | 1 ms                                               |
| - Number of incoming interconnections                                | 200                                                |
| - Number of outgoing interconnections                                | 200                                                |
| - Data length of all incoming interconnections, max.                 | 2 000 byte                                         |
| - Data length of all outgoing interconnections, max.                 | 2 000 byte                                         |
| - Data length per connection, max.                                   | 450 byte                                           |
| • HMI variables via PROFINET (acyclic)                               |                                                    |
| - Number of stations that can log on for HMI variables (PN OPC/iMap) | 3; 2x PN OPC/1x iMap                               |
| - HMI variable updating                                              | 500 ms                                             |
| - Number of HMI variables                                            | 200                                                |
| - Data length of all HMI variables, max.                             | 2 000 byte                                         |
| • PROFIBUS proxy functionality                                       |                                                    |
| - supported                                                          | Yes                                                |
| - Number of linked PROFIBUS devices                                  | 16                                                 |
| - Data length per connection, max.                                   | 240 byte; Slave-dependent                          |
| <b>1st interface</b>                                                 |                                                    |
| Type of interface                                                    | Integrated RS 485 interface                        |
| Physics                                                              | RS 485/connection: 2 x M12 b-coded                 |
| Isolated                                                             | Yes                                                |
| Power supply to interface (15 to 30 V DC), max.                      | May only be used for external terminating resistor |
| Functionality                                                        |                                                    |
| • MPI                                                                | Yes                                                |
| • DP master                                                          | Yes                                                |
| • DP slave                                                           | Yes                                                |
| • Point-to-point connection                                          | No                                                 |
| MPI                                                                  |                                                    |
| • Services                                                           |                                                    |
| - PG/OP communication                                                | Yes                                                |
| - Routing                                                            | Yes                                                |
| - Global data communication                                          | Yes                                                |
| - S7 basic communication                                             | Yes                                                |
| - S7 communication                                                   | Yes                                                |
| - S7 communication, as client                                        | No                                                 |
| - S7 communication, as server                                        | Yes                                                |
| • Transmission rate, max.                                            | 12 Mbit/s                                          |



## SIMATIC ET 200 distributed I/O

## ET 200pro

Interface modules  
IM 154-8 PN/DP CPU

## Technical specifications (continued)

| 6ES7 154-8AB01-0AB0                                   |                                                                                            |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------|
| DP master                                             |                                                                                            |
| • Services                                            |                                                                                            |
| - PG/OP communication                                 | Yes                                                                                        |
| - Routing                                             | Yes                                                                                        |
| - Global data communication                           | No                                                                                         |
| - S7 basic communication                              | Yes; I blocks only                                                                         |
| - S7 communication                                    | Yes                                                                                        |
| - S7 communication, as client                         | No                                                                                         |
| - S7 communication, as server                         | Yes; connection configured on one side only                                                |
| - Equidistance mode support                           | Yes                                                                                        |
| - Isochronous mode                                    | Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) |
| - SYNC/FREEZE                                         | Yes                                                                                        |
| - Activation/deactivation of DP slaves                | Yes                                                                                        |
| - Direct data exchange (slave-to-slave communication) | Yes; As subscriber                                                                         |
| - DPV1                                                | Yes                                                                                        |
| • Transmission rate, max.                             | 12 Mbit/s                                                                                  |
| • Number of DP slaves, max.                           | 124                                                                                        |
| • Address area                                        |                                                                                            |
| - Inputs, max.                                        | 2 048 byte                                                                                 |
| - Outputs, max.                                       | 2 048 byte                                                                                 |
| • User data per DP slave                              |                                                                                            |
| - Inputs, max.                                        | 244 byte                                                                                   |
| - Outputs, max.                                       | 244 byte                                                                                   |
| DP slave                                              |                                                                                            |
| • Services                                            |                                                                                            |
| - Routing                                             | Yes; with active interface                                                                 |
| - Global data communication                           | No                                                                                         |
| - S7 basic communication                              | No                                                                                         |
| - S7 communication                                    | Yes                                                                                        |
| - S7 communication, as client                         | No                                                                                         |
| - S7 communication, as server                         | Yes; connection configured on one side only                                                |
| - Direct data exchange (slave-to-slave communication) | Yes                                                                                        |
| - DPV1                                                | No                                                                                         |
| • Transmission rate, max.                             | 12 Mbit/s                                                                                  |
| • Transfer memory                                     |                                                                                            |
| - Inputs                                              | 244 byte                                                                                   |
| - Outputs                                             | 244 byte                                                                                   |
| • Address area, max.                                  | 32                                                                                         |
| • User data per address area, max.                    | 32 byte                                                                                    |
| <b>2nd interface</b>                                  |                                                                                            |
| Type of interface                                     | PROFINET                                                                                   |
| Physics                                               | Ethernet (2 x M12 d-coded; 1 x RJ45)                                                       |
| Isolated                                              | Yes; Galvanic isolation for P3 is implemented in IM154-8, for P1 and P2 in CM              |
| Integrated switch                                     | Yes                                                                                        |
| Number of ports                                       | 3                                                                                          |
| automatic detection of transmission speed             | Yes; 10/100 Mbit/s                                                                         |
| Autonegotiation                                       | Yes                                                                                        |
| Autocrossing                                          | Yes                                                                                        |

| 6ES7 154-8AB01-0AB0                                                           |                                                                                            |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Media redundancy                                                              |                                                                                            |
| • supported                                                                   | Yes                                                                                        |
| • Switchover time on line break, typically                                    | 200 ms; PROFINET MRP                                                                       |
| • Number of stations in the ring, max.                                        | 50                                                                                         |
| Change of IP address at runtime, supported                                    | Yes                                                                                        |
| Functionality                                                                 |                                                                                            |
| • MPI                                                                         | No                                                                                         |
| • DP master                                                                   | No                                                                                         |
| • DP slave                                                                    | No                                                                                         |
| • PROFINET IO controller                                                      | Yes; also simultaneously with IO device functionality                                      |
| • PROFINET IO device                                                          | Yes; also simultaneously with IO controller functionality                                  |
| • PROFINET CBA                                                                | Yes                                                                                        |
| • Open IE communication                                                       | Yes; Via TCP/IP, ISO on TCP, UDP                                                           |
| • Web server                                                                  | Yes                                                                                        |
| PROFINET IO controller                                                        |                                                                                            |
| • Services                                                                    |                                                                                            |
| - PG/OP communication                                                         | Yes                                                                                        |
| - Routing                                                                     | Yes                                                                                        |
| - S7 communication                                                            | Yes; with loadable FBs, max. configurable connections: 14, max. number of instances: 32    |
| - Isochronous mode                                                            | Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) |
| - Open IE communication                                                       | Yes; Via TCP/IP, ISO on TCP, UDP                                                           |
| • Transmission rate, max.                                                     | 100 Mbit/s                                                                                 |
| • Number of connectable IO devices, max.                                      | 128                                                                                        |
| • Max. number of connectable IO devices for RT                                | 128                                                                                        |
| - of which in line, max.                                                      | 128                                                                                        |
| • Number of IO devices with IRT and the option "high flexibility"             | 128                                                                                        |
| - of which in line, max.                                                      | 61                                                                                         |
| • Number of IO devices with IRT and the option "high performance", max.       | 64                                                                                         |
| - of which in line, max.                                                      | 64                                                                                         |
| • IRT, supported                                                              | Yes                                                                                        |
| • Shared device, supported                                                    | Yes                                                                                        |
| • Prioritized startup supported                                               | Yes                                                                                        |
| - Number of IO devices, max.                                                  | 32                                                                                         |
| • Activation/deactivation of IO devices                                       | Yes                                                                                        |
| - Number of IO devices that can be simultaneously activated/deactivated, max. | 8                                                                                          |
| • IO devices changing during operation (partner ports), supported             | Yes                                                                                        |
| - Max. number of IO devices per tool                                          | 8                                                                                          |
| • Device replacement without swap medium                                      | Yes                                                                                        |
| • Send clock times                                                            | 250 µs, 500 µs, 1 ms; 2 ms, 4 ms (not in the case of IRT with "high flexibility" option)   |

## Technical specifications (continued)

| 6ES7 154-8AB01-0AB0                                 |                                                                                                                                 |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| • Updating time                                     | 250 µs to 512 ms (depending on the operating mode, see "IM 154-8 CPU Interface Module" operating instructions for more details) |
| • Address area                                      |                                                                                                                                 |
| - Inputs, max.                                      | 2 048 byte                                                                                                                      |
| - Outputs, max.                                     | 2 048 byte                                                                                                                      |
| • User data per address area, max.                  |                                                                                                                                 |
| - User data consistency, max.                       | 1 024 byte                                                                                                                      |
| PROFINET IO device                                  |                                                                                                                                 |
| • Services                                          |                                                                                                                                 |
| - PG/OP communication                               | Yes                                                                                                                             |
| - Routing                                           | Yes                                                                                                                             |
| - S7 routing                                        | Yes                                                                                                                             |
| - S7 communication                                  | Yes; with loadable FBs, max. configurable connections: 14, max. number of instances: 32                                         |
| - Isochronous mode                                  | No                                                                                                                              |
| - Open IE communication                             | Yes; via TCP/IP, ISO on TCP, UDP                                                                                                |
| - IRT, supported                                    | Yes                                                                                                                             |
| - PROFinergy, supported                             | Yes; with SFB 73 / 74 prepared for loadable PROFinergy standard FB for I-Device                                                 |
| - Shared device, supported                          | Yes                                                                                                                             |
| - Number of IO controllers with shared device, max. | 2                                                                                                                               |
| • Transfer memory                                   |                                                                                                                                 |
| - Inputs, max.                                      | 1 440 byte; per IO controller with shared device                                                                                |
| - Outputs, max.                                     | 1 440 byte; per IO controller with shared device                                                                                |
| • Submodules                                        |                                                                                                                                 |
| - Number, max.                                      | 64                                                                                                                              |
| - User data per submodule, max.                     | 1 024 byte                                                                                                                      |
| PROFINET CBA                                        |                                                                                                                                 |
| • acyclic transmission                              | Yes                                                                                                                             |
| • cyclic transmission                               | Yes                                                                                                                             |
| Open IE communication                               |                                                                                                                                 |
| • Open IE communication, supported                  | Yes                                                                                                                             |
| • Number of connections, max.                       | 8                                                                                                                               |
| • Local port numbers used at the system end         | 0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535                                     |
| • Keep-alive function, supported                    | Yes                                                                                                                             |

| 6ES7 154-8AB01-0AB0                                    |                                                                              |
|--------------------------------------------------------|------------------------------------------------------------------------------|
| <b>Isochronous mode</b>                                |                                                                              |
| Isochronous mode                                       | Yes; via PROFIBUS DP or PROFINET interface                                   |
| <b>Programming</b>                                     |                                                                              |
| Programming language                                   |                                                                              |
| • STEP 7                                               | Yes; V5.5 or higher                                                          |
| • LAD                                                  | Yes                                                                          |
| • FBD                                                  | Yes                                                                          |
| • STL                                                  | Yes                                                                          |
| • SCL                                                  | Yes                                                                          |
| • CFC                                                  | Yes                                                                          |
| • GRAPH                                                | Yes                                                                          |
| • HiGraph®                                             | Yes                                                                          |
| Command set                                            | see instruction list                                                         |
| Nesting levels                                         | 8                                                                            |
| Know-how protection                                    |                                                                              |
| • User program protection/ password protection         | Yes                                                                          |
| • Block encryption                                     | Yes; With S7 block Privacy                                                   |
| System functions (SFC)                                 | See instruction list                                                         |
| System function blocks (SFB)                           | See instruction list                                                         |
| <b>Galvanic isolation</b>                              |                                                                              |
| between backplane bus and electronics                  | No                                                                           |
| between backplane bus and all other circuit components | Yes                                                                          |
| between supply and all other circuits                  | Yes                                                                          |
| <b>Standards, approvals, certificates</b>              |                                                                              |
| CE mark                                                | Yes                                                                          |
| CSA approval                                           | No                                                                           |
| C-TICK                                                 | Yes                                                                          |
| cULus                                                  | Yes                                                                          |
| FM approval                                            | No                                                                           |
| <b>Dimensions and weight</b>                           |                                                                              |
| Dimensions                                             |                                                                              |
| • Width                                                | 135 mm                                                                       |
| • Height                                               | 130 mm                                                                       |
| • Depth                                                | 65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket |
| Weight                                                 |                                                                              |
| • Weight, approx.                                      | 720 g                                                                        |

## Ordering data

| Order No.                                                                                         |                            |
|---------------------------------------------------------------------------------------------------|----------------------------|
| <b>IM 154-8 PN/DP CPU interface module, V3.2</b>                                                  | <b>6ES7 154-8AB01-0AB0</b> |
| PROFINET IO controller to operate distributed I/Os on PROFINET, with integrated PLC functionality |                            |
| <b>Accessories</b>                                                                                |                            |
| <b>MMC 64 KB <sup>1)</sup></b>                                                                    | <b>6ES7 953-8LF20-0AA0</b> |
| For program backup                                                                                |                            |
| <b>MMC 128 KB <sup>1)</sup></b>                                                                   | <b>6ES7 953-8LG20-0AA0</b> |
| For program backup                                                                                |                            |

| Order No.                                  |                            |
|--------------------------------------------|----------------------------|
| <b>MMC 512 KB <sup>1)</sup></b>            | <b>6ES7 953-8LJ20-0AA0</b> |
| For program backup                         |                            |
| <b>MMC 2 MB <sup>1)</sup></b>              | <b>6ES7 953-8LL20-0AA0</b> |
| for program backup and/or firmware updates |                            |
| <b>MMC 4 MB <sup>1)</sup></b>              | <b>6ES7 953-8LM20-0AA0</b> |
| For program backup                         |                            |
| <b>MMC 8 MB <sup>1)</sup></b>              | <b>6ES7 953-8LP20-0AA0</b> |
| For program backup                         |                            |

<sup>1)</sup> An MMC is essential for operating the CPU

I: Subject to export regulations AL: N and ECCN: EAR99H



## SIMATIC ET 200 distributed I/O

## ET 200pro

Interface modules  
IM 154-8 PN/DP CPU

| Ordering data                                                                                                                                                                                                                                                                                                                                                   | Order No.                                                               | Order No.                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Connection module</b><br>For CPU IM154-8 PN/DP, with 4 x M12 and 2 x 7/8", to connect PROFINET and PROFIBUS DP                                                                                                                                                                                                                                               | <b>6ES7 194-4AN00-0AA0</b>                                              | <b>IE Connecting Cable M12-180/ M12-180</b><br>Preassembled IE FC TP Trailing Cable GP 2 x 2 (PROFINET Type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, length:                                                                                 |
| <b>SCALANCE X-200 Industrial Ethernet Switches</b><br>With integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics, for setting up linear, star and ring structures<br>SCALANCE X208PRO, in degree of protection IP65, with eight 10/100 Mbit/s M12 ports, incl. eleven M12 dust caps                                          | <b>6GK5 208-0HA00-2AA6</b>                                              | 0.3 m <b>6XV1 870-8AE30</b><br>0.5 m <b>6XV1 870-8AE50</b><br>1.0 m <b>6XV1 870-8AH10</b><br>1.5 m <b>6XV1 870-8AH15</b><br>2.0 m <b>6XV1 870-8AH20</b><br>3.0 m <b>6XV1 870-8AH30</b><br>5.0 m <b>6XV1 870-8AH50</b><br>10 m <b>6XV1 870-8AN10</b><br>15 m <b>6XV1 870-8AN15</b> |
| <b>Industrial Ethernet FC RJ45 Plug 90</b><br>RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet                                                                                                        |                                                                         | PROFINET M12 connecting cable, trailing cable preassembled at both ends with angled M12 connectors (male insert)                                                                                                                                                                  |
| 1 unit                                                                                                                                                                                                                                                                                                                                                          | <b>6GK1 901-1BB20-2AA0</b>                                              | 3.0 m F <b>3RK1 902-2NB30</b>                                                                                                                                                                                                                                                     |
| 10 units                                                                                                                                                                                                                                                                                                                                                        | <b>6GK1 901-1BB20-2AB0</b>                                              | 5.0 m F <b>3RK1 902-2NB50</b>                                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                                                                                                 |                                                                         | 10 m F <b>3RK1 902-2NC10</b>                                                                                                                                                                                                                                                      |
| <b>Industrial Ethernet FC RJ45 Plug 180</b><br>RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet                                                                                                      |                                                                         | PROFINET M12 connecting cable, trailing cable preassembled at one end with angled M12 connector (male insert at one end, other end unconnected)                                                                                                                                   |
| 1 unit                                                                                                                                                                                                                                                                                                                                                          | <b>6GK1 901-1BB10-2AA0</b>                                              | 3.0 m F <b>3RK1 902-2HB30</b>                                                                                                                                                                                                                                                     |
| 10 units                                                                                                                                                                                                                                                                                                                                                        | <b>6GK1 901-1BB10-2AB0</b>                                              | 5.0 m F <b>3RK1 902-2HB50</b>                                                                                                                                                                                                                                                     |
| 50 units                                                                                                                                                                                                                                                                                                                                                        | <b>6GK1 901-1BB10-2AE0</b>                                              | 10 m F <b>3RK1 902-2HC10</b>                                                                                                                                                                                                                                                      |
| <b>Industrial Ethernet Fast Connect installation cables</b> <ul style="list-style-type: none"> <li>• Fast Connect standard cable</li> <li>• Fast Connect trailing cable</li> <li>• Fast Connect marine cable</li> </ul>                                                                                                                                         | <b>6XV1 840-2AH10</b><br><b>6XV1 840-3AH10</b><br><b>6XV1 840-4AH10</b> | <b>IE FC M12 Plug PRO</b><br>PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet                                                                                                                                                                 |
| <b>Industrial Ethernet FastConnect installation cables</b> <ul style="list-style-type: none"> <li>• IE FC TP Trailing Cable GP 2 x 2;<br/>Sold by the meter, max. order quantity 1000 m;<br/>Minimum order quantity 20 m</li> <li>• IE TP Torsion Cable GP 2 x 2;<br/>Sold by the meter, max. order quantity 1000 m;<br/>Minimum order quantity 20 m</li> </ul> | <b>6XV1 870-2D</b><br><b>6XV1 870-2F</b>                                | 1 unit I <b>6GK1 901-0DB20-6AA0</b><br>8 units I <b>6GK1 901-0DB20-6AA8</b><br>PROFINET M12 plug connector, D-coded, angled <b>3RK1 902-2DA00</b>                                                                                                                                 |
| <b>Industrial Ethernet Fast Connect</b><br>Stripping Tool                                                                                                                                                                                                                                                                                                       | <b>6GK1 901-1GA00</b>                                                   | <b>IE panel feedthrough</b><br>Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                 |                                                                         | I <b>6GK1 901-0DM20-2AA5</b>                                                                                                                                                                                                                                                      |

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| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Order No.                                                                                                                                                                                                                                                                                     | Order No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>7/8" connecting cable to power supply</b><br>5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m <ul style="list-style-type: none"> <li>• 1.5 m long</li> <li>• 2.0 m long</li> <li>• 3.0 m long</li> <li>• 5.0 m long</li> <li>• 10 m long</li> <li>• 15 m long</li> <li>• Other special lengths with 90° or 180° cable outlet</li> </ul>                                                                                                                 | <b>6XV1 822-5BH15</b><br><b>6XV1 822-5BH20</b><br><b>6XV1 822-5BH30</b><br><b>6XV1 822-5BH50</b><br><b>6XV1 822-5BN10</b><br><b>6XV1 822-5BN15</b><br>siehe <a href="http://support.automation.siemens.com/WW/view/en/26999294">http://support.automation.siemens.com/WW/view/en/26999294</a> | <b>M12 sealing cap</b><br>For protection of unused M12 connections with ET 200pro<br><b>3RX9 802-0AA00</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| power cable, can be trailed, 5 x 1.5 mm <sup>2</sup> , preassembled at both ends with 7/8" angled connectors (female insert at one end, male insert at the other end) <ul style="list-style-type: none"> <li>• 3.0 m long</li> <li>• 5.0 m long</li> <li>• 10 m long</li> <li>• Power cable, can be trailed, 5 x 1.5 mm<sup>2</sup>, preassembled at one end with 7/8" angled connector with female insert (female insert at one end, other end unconnected)</li> <li>• 3.0 m long</li> <li>• 5.0 m long</li> <li>• 10 m long</li> </ul> | <b>3RK1 902-3NB30</b><br><b>3RK1 902-3NB50</b><br><b>3RK1 902-3NC10</b><br><b>3RK1 902-3GB30</b><br><b>3RK1 902-3GB50</b><br><b>3RK1 902-3GC10</b>                                                                                                                                            | <b>M12 sealing caps with female thread</b><br>5 units<br><b>6ES7 194-4JD60-0AA0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Power line</b><br>5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m                                                                                                                                                                                                                                                                                                                                                                                      | <b>6XV1 830-8AH10</b>                                                                                                                                                                                                                                                                         | <b>PROFIBUS M12 connecting cable</b><br>Preassembled, with two 5-pole M12 connectors/sockets, up to 100 m; length: <ul style="list-style-type: none"> <li>• 1.5 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10 m</li> <li>• 15 m</li> </ul> Other special lengths with 90° or 180° cable outlet<br>M12 bus termination connector for PROFIBUS, female insert<br>M12 bus termination connector for PROFIBUS, male insert<br>M12 plug connector, axial outlet, with male insert<br><b>6XV1 830-3DH15</b><br><b>6XV1 830-3DH20</b><br><b>6XV1 830-3DH30</b><br><b>6XV1 830-3DH50</b><br><b>6XV1 830-3DN10</b><br><b>6XV1 830-3DN15</b><br>See <a href="http://support.automation.siemens.com/WW/view/en/26999294">http://support.automation.siemens.com/WW/view/en/26999294</a><br><b>6GK1 905-0ED00</b><br><b>6GK1 905-0EC00</b><br><b>6GK1 905-0EA00</b> |
| <b>7/8" cable connector</b><br>For ET 200eco, with axial cable outlet <ul style="list-style-type: none"> <li>• with male insert, 5 per pack</li> <li>• with female insert, 5 per pack</li> <li>• angled, with female insert, 1 unit</li> <li>• angled, with male insert, 1 unit</li> </ul> 7/8" cover cap, 10 per pack                                                                                                                                                                                                                   | <b>6GK1 905-0FA00</b><br><b>6GK1 905-0FB00</b><br><b>3RK1 902-3DA00</b><br><b>3RK1 902-3BA00</b><br><b>6ES7 194-3JA00-0AA0</b>                                                                                                                                                                | <b>PROFIBUS FC Standard Cable GP</b><br>Standard type specially designed for fast assembly, 2-core, shielded,<br>Sold by the meter;<br>Max. delivery unit 1000 m,<br>Minimum order quantity 20 m<br><b>6XV1 830-0EH10</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Twisted Pair cables 4x2 with RJ45 connectors</b><br>0.5 m long<br>1 m long<br>2 m long<br>6 m long<br>10 m long                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>6XV1 870-3QE50</b><br><b>6XV1 870-3QH10</b><br><b>6XV1 870-3QH20</b><br><b>6XV1 870-3QH60</b><br><b>6XV1 870-3QN10</b>                                                                                                                                                                     | <b>PROFIBUS FC Trailing Cable</b><br>2-core, shielded<br><b>6XV1 830-3EH10</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Crossed Twisted Pair cables 4x2 with RJ45 connectors</b><br>0.5 m long<br>1 m long<br>2 m long<br>6 m long<br>10 m long                                                                                                                                                                                                                                                                                                                                                                                                               | <b>6XV1 870-3RE50</b><br><b>6XV1 870-3RH10</b><br><b>6XV1 870-3RH20</b><br><b>6XV1 870-3RH60</b><br><b>6XV1 870-3RN10</b>                                                                                                                                                                     | <b>PROFIBUS FC Food Cable</b><br>2-core, shielded<br>Sold by the meter;<br>Max. delivery unit 1000 m,<br>Minimum order quantity 20 m<br><b>6XV1 830-0GH10</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                               | <b>PROFIBUS FC Robust Cable</b><br>2-core, shielded<br>Sold by the meter;<br>Max. delivery unit 1000 m,<br>Minimum order quantity 20 m<br><b>6XV1 830-0JH10</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                               | <b>PROFIBUS M12 cable connector</b><br>5-pole, B-coded, metal casing, 1 pack = 5 units<br>• Female insert<br><b>6GK1 905-0EB00</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

F: Subject to export regulations AL: N and ECCN: EAR99  
 I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200pro

### Interface modules IM 154-8 F PN/DP CPU

#### Overview



- Interface module for SIMATIC ET 200pro with integrated fail-safe CPU
- CPU with PLC functionality equivalent to CPU S7-315F PN/DP; with distributed intelligence for preprocessing

- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061, up to PLe according to ISO 13849-1:2006 and Cat. 4 according to EN 954-1
- For high-performance control solutions in ET 200pro
- Increase of the availability of systems and machines
- Integral Web server with the option of creating user-defined Web sites
- Isochronous mode on PROFIBUS or PROFINET
- PROFINET IO controller for up to 128 IO devices
- PROFINET interface with integrated 3-port switch
- With many communication options:  
PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7-communication (with loadable FBs)
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)

#### Note:

SIMATIC Micro Memory Card required for operation of CPU.

#### Technical specifications

| 6ES7 154-8FB01-0AB0                                                                 |                                                                                           |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Product version</b><br>associated programming package                            | STEP 7 V 5.5 or higher,<br>Distributed Safety V 5.4 SP4                                   |
| <b>Supply voltages</b><br>external protection for supply<br>cables (recommendation) | MCB 24 V DC / 16 A with tripping<br>characteristic Type B and C<br>(see ET 200pro manual) |
| <b>Current consumption</b><br>Current consumption (rated value)                     | 350 mA; typical                                                                           |
| Current consumption<br>(in no-load operation), typ.                                 | 250 mA; typical, current<br>consumption for CPU in STOP<br>state                          |
| Inrush current, typ.                                                                | 2 A; typical                                                                              |
| I <sub>2t</sub>                                                                     | 0.25 A <sup>2</sup> s; typical                                                            |
| <b>Power losses</b><br>Power loss, typ.                                             | 8.5 W; typical                                                                            |
| <b>Memory</b><br>Work memory<br>• integrated<br>• expandable                        | 512 Kibyte<br>No                                                                          |
| Load memory<br>• pluggable (MMC)<br>• pluggable (MMC), max.                         | Yes<br>8 Mbyte                                                                            |
| Backup<br>• present                                                                 | Yes; ensured by MMC<br>(maintenance-free)                                                 |
| • without battery                                                                   | Yes; program and data                                                                     |
| <b>CPU-blocks</b><br>DB<br>• Number, max.<br>• Size, max.                           | 1 024; Number range: 1 to 16,000<br>64 Kibyte                                             |

| 6ES7 154-8FB01-0AB0                                                                                                                                                                                              |                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>FB</b><br>• Number, max.<br>• Size, max.                                                                                                                                                                      | 1 024; number range: 0 to 7,999<br>64 Kibyte |
| <b>FC</b><br>• Number, max.<br>• Size, max.                                                                                                                                                                      | 1 024; number range: 0 to 7,999<br>64 Kibyte |
| <b>OB</b><br>• Size, max.                                                                                                                                                                                        | 64 Kibyte                                    |
| <b>Nesting depth</b><br>• per priority class<br>• additional within an error OB                                                                                                                                  | 16<br>4                                      |
| <b>CPU processing times</b><br>for bit operations, min.                                                                                                                                                          | 0.05 µs                                      |
| for word operations, min.                                                                                                                                                                                        | 0.09 µs                                      |
| for fixed point arithmetic, min.                                                                                                                                                                                 | 0.12 µs                                      |
| for floating point arithmetic, min.                                                                                                                                                                              | 0.45 µs                                      |
| <b>Counters, timers and their<br/>retentivity</b><br>S7 counter<br>• Number<br>• Retentivity<br>- adjusted<br>- lower limit<br>- upper limit<br>• Counting range<br>- adjusted<br>- lower limit<br>- upper limit | 256<br>Yes<br>0<br>255<br>Yes<br>0<br>999    |
| IEC counter<br>• present<br>• Type                                                                                                                                                                               | Yes<br>SFB                                   |

## Technical specifications (continued)

| 6ES7 154-8FB01-0AB0                     |                                                                          |
|-----------------------------------------|--------------------------------------------------------------------------|
| S7 times                                |                                                                          |
| • Number                                | 256                                                                      |
| • Retentivity                           |                                                                          |
| - adjusted                              | Yes                                                                      |
| - lower limit                           | 0                                                                        |
| - upper limit                           | 255                                                                      |
| - preset                                | No retentivity                                                           |
| • Time range                            |                                                                          |
| - lower limit                           | 10 ms                                                                    |
| - upper limit                           | 9 990 s                                                                  |
| IEC timer                               |                                                                          |
| • present                               | Yes                                                                      |
| • Type                                  | SFB                                                                      |
| • Number                                | Unlimited<br>(limited only by RAM capacity)                              |
| <b>Data areas and their retentivity</b> |                                                                          |
| Flag                                    |                                                                          |
| • Number, max.                          | 2 048 byte                                                               |
| • Retentivity available                 | Yes; MB 0 to MB 2047                                                     |
| • Number of clock memories              | 8                                                                        |
| Data blocks                             |                                                                          |
| • Number, max.                          | 1 024; Number range: 1 to 16,000                                         |
| • Size, max.                            | 64 Kibyte                                                                |
| • Retentivity adjustable                | Yes; via non-retain property on DB                                       |
| • Retentivity preset                    | yes                                                                      |
| Local data                              |                                                                          |
| • per priority class, max.              | 32 768 byte; 2048 byte max. per block                                    |
| <b>Address area</b>                     |                                                                          |
| I/O address area                        |                                                                          |
| • overall                               | 2 048 byte                                                               |
| • Outputs                               | 2 048 byte                                                               |
| • of which, distributed                 |                                                                          |
| - Inputs                                | 2 048 byte                                                               |
| - Outputs                               | 2 048 byte                                                               |
| Process image                           |                                                                          |
| • Inputs, adjustable                    | 2 048 byte                                                               |
| • Outputs, adjustable                   | 2 048 byte                                                               |
| • Inputs, preset                        | 128 byte                                                                 |
| • Outputs, preset                       | 128 byte                                                                 |
| Subprocess images                       |                                                                          |
| • Number of subprocess images, max.     | 1; With PROFINET IO, the length of the user data is limited to 1600 byte |
| Digital channels                        |                                                                          |
| • Inputs                                | 16 384                                                                   |
| • Outputs                               | 16 384                                                                   |
| • Inputs, of which central              | 128                                                                      |
| • Outputs, of which central             | 64                                                                       |
| Analog channels                         |                                                                          |
| • Inputs                                | 1 024                                                                    |
| • Outputs                               | 1 024                                                                    |
| • Inputs, of which central              | 64                                                                       |
| • Outputs, of which central             | 64                                                                       |

| 6ES7 154-8FB01-0AB0                                  |                                                                                  |
|------------------------------------------------------|----------------------------------------------------------------------------------|
| <b>Hardware configuration</b>                        |                                                                                  |
| Racks, max.                                          | 1                                                                                |
| Modules per rack, max.                               | 16; Expansion width max. 1 m                                                     |
| Number of DP masters                                 |                                                                                  |
| • integrated                                         | 1                                                                                |
| <b>Time</b>                                          |                                                                                  |
| Clock                                                |                                                                                  |
| • Hardware clock (real-time clock)                   | Yes                                                                              |
| • battery-backed and synchro-nizable                 | Yes                                                                              |
| • Deviation per day, max.                            | 10 s; typ.: 2 s                                                                  |
| Runtime meter                                        |                                                                                  |
| • Number                                             | 1                                                                                |
| • Number/Number range                                | 0                                                                                |
| • Range of values                                    | 0 to 2 <sup>31</sup> hours<br>(when using SFC 101)                               |
| • Granularity                                        | 1 h                                                                              |
| • retentive                                          | Yes; must be restarted at each restart                                           |
| Clock synchronization                                |                                                                                  |
| • supported                                          | Yes                                                                              |
| • to MPI, master                                     | Yes                                                                              |
| • to MPI, slave                                      | Yes                                                                              |
| • to DP, master                                      | Yes; with DP slave only slave clock                                              |
| • to DP, slave                                       | Yes                                                                              |
| • on Ethernet via NTP                                | Yes; as client                                                                   |
| <b>S7 message functions</b>                          |                                                                                  |
| Number of login stations for message functions, max. | 16; depending on the connections configured for PG/OP and S7 basic communication |
| Process diagnostic messages                          | Yes                                                                              |
| Simultaneously active Alarm-S blocks, max.           | 300                                                                              |
| <b>Test commissioning functions</b>                  |                                                                                  |
| Status/control                                       |                                                                                  |
| • Status/control variable                            | Yes                                                                              |
| • Variables                                          | Inputs, outputs, memory bits, DB, times, counters                                |
| • Number of variables, max.                          | 30                                                                               |
| • of which status variables, max.                    | 30                                                                               |
| • of which control variables, max.                   | 14                                                                               |
| Forcing                                              |                                                                                  |
| • Forcing                                            | Yes                                                                              |
| Status block                                         | Yes; up to 2 simultaneously                                                      |
| Single step                                          | Yes                                                                              |
| Number of breakpoints                                | 4                                                                                |
| Diagnostic buffer                                    |                                                                                  |
| • Present                                            | Yes                                                                              |
| • Number of entries, max.                            | 500; only the last 100 entries are retentive at power on/off                     |
| - adjusted                                           | No                                                                               |
| - preset                                             | 10                                                                               |
| <b>Monitoring functions</b>                          |                                                                                  |
| Status LEDs                                          | Yes                                                                              |

## SIMATIC ET 200 distributed I/O

## ET 200pro

Interface modules  
IM 154-8 F PN/DP CPU

## Technical specifications (continued)

| 6ES7 154-8FB01-0AB0                                                  |                                                                                                         |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>Communication functions</b>                                       |                                                                                                         |
| PG/OP communication                                                  | Yes                                                                                                     |
| Routing                                                              | Yes                                                                                                     |
| Global data communication                                            |                                                                                                         |
| • supported                                                          | Yes                                                                                                     |
| • Size of GD packets, max.                                           | 22 byte                                                                                                 |
| S7 basic communication                                               |                                                                                                         |
| • supported                                                          | Yes                                                                                                     |
| S7 communication                                                     |                                                                                                         |
| • supported                                                          | Yes                                                                                                     |
| Web server                                                           |                                                                                                         |
| • supported                                                          | Yes                                                                                                     |
| • Number of HTTP clients                                             | 5                                                                                                       |
| • User-defined websites                                              | Yes                                                                                                     |
| Open IE communication                                                |                                                                                                         |
| • TCP/IP                                                             | Yes; Via integrated PROFINET interface and loadable FBs                                                 |
| - Number of connections, max.                                        | 8                                                                                                       |
| - Data length, max.                                                  | 32 768 byte; 1460 byte with connection type 01H; 32768 byte with connection type 11H                    |
| - Several passive connections per port, supported                    | Yes                                                                                                     |
| • ISO-on-TCP (RFC1006)                                               | Yes                                                                                                     |
| - Number of connections, max.                                        | 8                                                                                                       |
| - Data length, max.                                                  | 32 768 byte                                                                                             |
| • UDP                                                                | Yes                                                                                                     |
| - Number of connections, max.                                        | 8                                                                                                       |
| - Data length, max.                                                  | 1 472 byte                                                                                              |
| Number of connections                                                |                                                                                                         |
| • overall                                                            | 16                                                                                                      |
| • usable for PG communication                                        | 15                                                                                                      |
| • usable for OP communication                                        | 15                                                                                                      |
| • usable for S7 basic communication                                  | 14                                                                                                      |
| • usable for routing                                                 | X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: 24 max. |
| PROFINET CBA (at set setpoint communication load)                    |                                                                                                         |
| • Setpoint for the CPU communication load                            | 50 %                                                                                                    |
| • Number of remote interconnection partners                          | 32                                                                                                      |
| • Number of functions, master/slave                                  | 30                                                                                                      |
| • Total of all Master/Slave connections                              | 1 000                                                                                                   |
| • Data length of all incoming connections master/slave, max.         | 4 000 byte                                                                                              |
| • Data length of all outgoing connections master/slave, max.         | 4 000 byte                                                                                              |
| • Number of device-internal and PROFIBUS interconnections            | 500                                                                                                     |
| • Data length of device-internal und PROFIBUS interconnections, max. | 4 000 byte                                                                                              |
| • Data length per connection, max.                                   | 1 400 byte                                                                                              |

| 6ES7 154-8FB01-0AB0                                                  |                                                    |
|----------------------------------------------------------------------|----------------------------------------------------|
| • Remote interconnections with acyclic transmission                  |                                                    |
|                                                                      |                                                    |
| - Sampling frequency: Sampling time, min.                            | 500 ms                                             |
| - Number of incoming interconnections                                | 100                                                |
| - Number of outgoing interconnections                                | 100                                                |
| - Data length of all incoming interconnections, max.                 | 2 000 byte                                         |
| - Data length of all outgoing interconnections, max.                 | 2 000 byte                                         |
| - Data length per connection, max.                                   | 1 400 byte                                         |
| • Remote interconnections with cyclic transmission                   |                                                    |
|                                                                      |                                                    |
| - Transmission frequency: Transmission interval, min.                | 1 ms                                               |
| - Number of incoming interconnections                                | 200                                                |
| - Number of outgoing interconnections                                | 200                                                |
| - Data length of all incoming interconnections, max.                 | 2 000 byte                                         |
| - Data length of all outgoing interconnections, max.                 | 2 000 byte                                         |
| - Data length per connection, max.                                   | 450 byte                                           |
| • HMI variables via PROFINET (acyclic)                               |                                                    |
|                                                                      |                                                    |
| - Number of stations that can log on for HMI variables (PN OPC/iMap) | 3; 2x PN OPC/1x iMap                               |
| - HMI variable updating                                              | 500 ms                                             |
| - Number of HMI variables                                            | 200                                                |
| - Data length of all HMI variables, max.                             | 2 000 byte                                         |
| • PROFIBUS proxy functionality                                       |                                                    |
|                                                                      |                                                    |
| - supported                                                          | Yes                                                |
| - Number of linked PROFIBUS devices                                  | 16                                                 |
| - Data length per connection, max.                                   | 240 byte; Slave-dependent                          |
| <b>1st interface</b>                                                 |                                                    |
| Type of interface                                                    | Integrated RS 485 interface                        |
| Physics                                                              | RS 485/connection: 2 x M12 b-coded                 |
| Isolated                                                             | Yes                                                |
| Power supply to interface (15 to 30 V DC), max.                      | May only be used for external terminating resistor |
| Functionality                                                        |                                                    |
| • MPI                                                                | Yes                                                |
| • DP master                                                          | Yes                                                |
| • DP slave                                                           | Yes                                                |
| • Point-to-point connection                                          | No                                                 |
| <b>MPI</b>                                                           |                                                    |
| • Services                                                           |                                                    |
| - PG/OP communication                                                | Yes                                                |
| - Routing                                                            | Yes                                                |
| - Global data communication                                          | Yes                                                |
| - S7 basic communication                                             | Yes                                                |
| - S7 communication                                                   | Yes                                                |
| - S7 communication, as client                                        | No                                                 |
| - S7 communication, as server                                        | Yes                                                |
| • Transmission rate, max.                                            | 12 Mbit/s                                          |

## Technical specifications (continued)

| 6ES7 154-8FB01-0AB0                                   |                                                                                            | 6ES7 154-8FB01-0AB0                                                           |                                                                                            |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| DP master                                             |                                                                                            | Media redundancy                                                              |                                                                                            |
| • Services                                            |                                                                                            | • supported                                                                   | Yes                                                                                        |
| - PG/OP communication                                 | Yes                                                                                        | • Switchover time on line break, typically                                    | 200 ms; PROFINET MRP                                                                       |
| - Routing                                             | Yes                                                                                        | • Number of stations in the ring, max.                                        | 50                                                                                         |
| - Global data communication                           | No                                                                                         |                                                                               |                                                                                            |
| - S7 basic communication                              | Yes; I blocks only                                                                         | Change of IP address at runtime, supported                                    | Yes                                                                                        |
| - S7 communication                                    | Yes                                                                                        |                                                                               |                                                                                            |
| - S7 communication, as client                         | No                                                                                         | Functionality                                                                 |                                                                                            |
| - S7 communication, as server                         | Yes; connection configured on one side only                                                | • MPI                                                                         | No                                                                                         |
| - Equidistance mode support                           | Yes                                                                                        | • DP master                                                                   | No                                                                                         |
| - Isochronous mode                                    | Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) | • DP slave                                                                    | No                                                                                         |
|                                                       |                                                                                            | • PROFINET IO controller                                                      | Yes; also simultaneously with IO device functionality                                      |
| - SYNC/FREEZE                                         | Yes                                                                                        | • PROFINET IO device                                                          | Yes; also simultaneously with IO controller functionality                                  |
| - Activation/deactivation of DP slaves                | Yes                                                                                        |                                                                               |                                                                                            |
| - Direct data exchange (slave-to-slave communication) | Yes; as subscriber                                                                         | • PROFINET CBA                                                                | Yes                                                                                        |
| - DPV1                                                | Yes                                                                                        | • Open IE communication                                                       | Yes; via TCP/IP, ISO on TCP, UDP                                                           |
| • Transmission rate, max.                             | 12 Mbit/s                                                                                  | • Web server                                                                  | Yes                                                                                        |
| • Number of DP slaves, max.                           | 124                                                                                        |                                                                               |                                                                                            |
| • Address area                                        |                                                                                            | PROFINET IO controller                                                        |                                                                                            |
| - Inputs, max.                                        | 2 048 byte                                                                                 | • Services                                                                    |                                                                                            |
| - Outputs, max.                                       | 2 048 byte                                                                                 | - PG/OP communication                                                         | Yes                                                                                        |
| • User data per DP slave                              |                                                                                            | - Routing                                                                     | Yes                                                                                        |
| - Inputs, max.                                        | 244 byte                                                                                   | - S7 communication                                                            | Yes; with loadable FBs, max. configurable connections: 14, max. number of instances: 32    |
| - Outputs, max.                                       | 244 byte                                                                                   | - Isochronous mode                                                            | Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) |
| DP slave                                              |                                                                                            | - Open IE communication                                                       | Yes; via TCP/IP, ISO on TCP, UDP                                                           |
| • Services                                            |                                                                                            | • Transmission rate, max.                                                     | 100 Mbit/s                                                                                 |
| - Routing                                             | Yes; with active interface                                                                 | • Number of connectable IO devices, max.                                      | 128                                                                                        |
| - Global data communication                           | No                                                                                         | • Max. number of connectable IO devices for RT                                | 128                                                                                        |
| - S7 basic communication                              | No                                                                                         | - of which in line, max.                                                      | 128                                                                                        |
| - S7 communication                                    | Yes                                                                                        | • Number of IO devices with IRT and the option "high flexibility"             | 128                                                                                        |
| - S7 communication, as client                         | No                                                                                         | - of which in line, max.                                                      | 61                                                                                         |
| - S7 communication, as server                         | Yes; connection configured on one side only                                                | • Number of IO devices with IRT and the option "high performance", max.       | 64                                                                                         |
| - Direct data exchange (slave-to-slave communication) | Yes                                                                                        | - of which in line, max.                                                      | 64                                                                                         |
| - DPV1                                                | No                                                                                         | • IRT, supported                                                              | Yes                                                                                        |
| • Transmission rate, max.                             | 12 Mbit/s                                                                                  | • Prioritized startup supported                                               | Yes                                                                                        |
| • Transfer memory                                     |                                                                                            | - Number of IO devices, max.                                                  | 32                                                                                         |
| - Inputs                                              | 244 byte                                                                                   | • Activation/deactivation of IO devices                                       | Yes                                                                                        |
| - Outputs                                             | 244 byte                                                                                   | - Number of IO devices that can be simultaneously activated/deactivated, max. | 8                                                                                          |
| • Address area, max.                                  | 32                                                                                         | • IO devices changing during operation (partner ports), supported             | Yes                                                                                        |
| • User data per address area, max.                    | 32 byte                                                                                    | - Max. number of IO devices per tool                                          | 8                                                                                          |
| <b>2nd interface</b>                                  |                                                                                            | • Device replacement without swap medium                                      | Yes                                                                                        |
| Type of interface                                     | PROFINET                                                                                   | • Send clock times                                                            | 250 µs, 500 µs, 1 ms; 2 ms, 4 ms (not in the case of IRT with "high flexibility" option)   |
| Physics                                               | Ethernet (2 x M12 d-coded; 1 x RJ45)                                                       |                                                                               |                                                                                            |
| Isolated                                              | Yes; galvanic isolation for P3 is implemented in IM154-8, for P1 and P2 in CM              |                                                                               |                                                                                            |
| Integrated switch                                     | Yes                                                                                        |                                                                               |                                                                                            |
| Number of ports                                       | 3                                                                                          |                                                                               |                                                                                            |
| automatic detection of transmission speed             | Yes; 10/100 Mbit/s                                                                         |                                                                               |                                                                                            |
| Autonegotiation                                       | Yes                                                                                        |                                                                               |                                                                                            |
| Autocrossing                                          | Yes                                                                                        |                                                                               |                                                                                            |



## SIMATIC ET 200 distributed I/O

## ET 200pro

Interface modules  
IM 154-8 F PN/DP CPU

## Technical specifications (continued)

| 6ES7 154-8FB01-0AB0                                 |                                                                                                                                 |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| • Updating time                                     | 250 µs to 512 ms (depending on the operating mode, see "IM 154-8 CPU Interface Module" operating instructions for more details) |
| • Address area                                      |                                                                                                                                 |
| - Inputs, max.                                      | 2 048 byte                                                                                                                      |
| - Outputs, max.                                     | 2 048 byte                                                                                                                      |
| • User data per address area, max.                  |                                                                                                                                 |
| - User data consistency, max.                       | 1 024 byte                                                                                                                      |
| PROFINET IO device                                  |                                                                                                                                 |
| • Services                                          |                                                                                                                                 |
| - PG/OP communication                               | Yes                                                                                                                             |
| - Routing                                           | Yes                                                                                                                             |
| - S7 routing                                        | Yes                                                                                                                             |
| - S7 communication                                  | Yes; with loadable FBs, max. configurable connections: 14, max. number of instances: 32                                         |
| - Isochronous mode                                  | No                                                                                                                              |
| - Open IE communication                             | Yes; via TCP/IP, ISO on TCP, UDP                                                                                                |
| - IRT, supported                                    | Yes                                                                                                                             |
| - PROFINergy, supported                             | Yes; with SFB 73 / 74 prepared for loadable PROFINergy standard FB for I-Device                                                 |
| - Shared device, supported                          | Yes                                                                                                                             |
| - Number of IO controllers with shared device, max. | 2                                                                                                                               |
| • Transfer memory                                   |                                                                                                                                 |
| - Inputs, max.                                      | 1 440 byte; per IO controller with shared device                                                                                |
| - Outputs, max.                                     | 1 440 byte; per IO controller with shared device                                                                                |
| • Submodules                                        |                                                                                                                                 |
| - Number, max.                                      | 64                                                                                                                              |
| - User data per submodule, max.                     | 1 024 byte                                                                                                                      |
| PROFINET CBA                                        |                                                                                                                                 |
| • acyclic transmission                              | Yes                                                                                                                             |
| • cyclic transmission                               | Yes                                                                                                                             |
| Open IE communication                               |                                                                                                                                 |
| • Open IE communication, supported                  | Yes                                                                                                                             |
| • Number of connections, max.                       | 8                                                                                                                               |
| • Local port numbers used at the system end         | 0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535                                     |
| • Keep-alive function, supported                    | Yes                                                                                                                             |
| <b>Isochronous mode</b>                             |                                                                                                                                 |
| Isochronous mode                                    | Yes; Via PROFIBUS DP or PROFINET interface                                                                                      |

| 6ES7 154-8FB01-0AB0                                    |                                                                              |
|--------------------------------------------------------|------------------------------------------------------------------------------|
| <b>Programming</b>                                     |                                                                              |
| Programming language                                   |                                                                              |
| • STEP 7                                               | Yes; V5.5 or higher                                                          |
| • LAD                                                  | Yes                                                                          |
| • FBD                                                  | Yes                                                                          |
| • STL                                                  | Yes                                                                          |
| • SCL                                                  | Yes                                                                          |
| • CFC                                                  | Yes                                                                          |
| • GRAPH                                                | Yes                                                                          |
| • HiGraph®                                             | Yes                                                                          |
| Command set                                            | see instruction list                                                         |
| Nesting levels                                         | 8                                                                            |
| Know-how protection                                    |                                                                              |
| • User program protection/ password protection         | Yes                                                                          |
| • Block encryption                                     | Yes; with S7 block Privacy                                                   |
| System functions (SFC)                                 | See instruction list                                                         |
| System function blocks (SFB)                           | See instruction list                                                         |
| <b>Galvanic isolation</b>                              |                                                                              |
| between backplane bus and electronics                  | No                                                                           |
| between backplane bus and all other circuit components | Yes                                                                          |
| between supply and all other circuits                  | Yes                                                                          |
| <b>Standards, approvals, certificates</b>              |                                                                              |
| CE mark                                                | Yes                                                                          |
| CSA approval                                           | No                                                                           |
| C-TICK                                                 | Yes                                                                          |
| cULus                                                  | Yes                                                                          |
| FM approval                                            | No                                                                           |
| <b>Dimensions and weight</b>                           |                                                                              |
| Dimensions                                             |                                                                              |
| • Width                                                | 135 mm                                                                       |
| • Height                                               | 130 mm                                                                       |
| • Depth                                                | 65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket |
| Weight                                                 |                                                                              |
| • Weight, approx.                                      | 720 g                                                                        |

| Ordering data                                                                                                                                                                                                                                                                                                           | Order No.                                                                    |                                                                                                                                                                                                                                                                                                                                                                            | Order No.                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>IM 154-8 F PN/DP CPU interface module, V3.2</b><br><br>Fail-safe PROFINET IO controller to operate distributed I/Os on PROFINET, with integrated PLC functionality                                                                                                                                                   | <b>6ES7 154-8FB01-0AB0</b>                                                   | <b>Industrial Ethernet FC RJ45 Plug 90</b><br><br>RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet<br><br>1 unit<br>10 units                                                                                     | <br><br><br><br><br><b>6GK1 901-1BB20-2AA0</b><br><b>6GK1 901-1BB20-2AB0</b>                                           |
| <b>Distributed Safety V5.4 programming tool</b><br><br>Task: Software for configuring fail-safe application programs for SIMATIC S7-300F, S7-400F, ET 200S<br><br>Requirements:<br>STEP 7 V5.3 SP3 and higher<br><br>Floating license<br><br>Software Update Service                                                    | <br><br><br><br><br><b>6ES7 833-1FC02-0YA5</b><br><b>6ES7 833-1FC00-0YX2</b> | <b>Industrial Ethernet FC RJ45 Plug 180</b><br><br>RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet<br><br>1 unit<br>10 units<br>50 units                                                                       | <br><br><br><br><br><br><br><br><b>6GK1 901-1BB10-2AA0</b><br><b>6GK1 901-1BB10-2AB0</b><br><b>6GK1 901-1BB10-2AE0</b> |
| <b>Distributed Safety Upgrade</b><br><br>From V5.3 to V5.4; Floating license for 1 user                                                                                                                                                                                                                                 | <b>6ES7 833-1FC02-0YE5</b>                                                   | <b>Industrial Ethernet Fast Connect installation cables</b> <ul style="list-style-type: none"><li>• Fast Connect standard cable</li><li>• Fast Connect trailing cable</li><li>• Fast Connect marine cable</li></ul>                                                                                                                                                        | <br><br><br><br><br><b>6XV1 840-2AH10</b><br><b>6XV1 840-3AH10</b><br><b>6XV1 840-4AH10</b>                            |
| <b>Accessories</b>                                                                                                                                                                                                                                                                                                      |                                                                              | <b>Industrial Ethernet FastConnect installation cables</b> <ul style="list-style-type: none"><li>• <b>IE FC TP Trailing Cable GP 2 x 2;</b><br/>Sold by the meter, max. order quantity 1000 m;<br/>Minimum order quantity 20 m</li><li>• <b>IE TP Torsion Cable GP 2 x 2;</b><br/>Sold by the meter, max. order quantity 1000 m;<br/>Minimum order quantity 20 m</li></ul> | <br><br><br><br><br><br><br><br><b>6XV1 870-2D</b><br><br><br><b>6XV1 870-2F</b>                                       |
| <b>MMC 64 KB <sup>1)</sup></b><br><br>for program backup                                                                                                                                                                                                                                                                | <b>6ES7 953-8LF20-0AA0</b>                                                   | <b>Industrial Ethernet Fast Connect</b><br><br>Stripping Tool                                                                                                                                                                                                                                                                                                              | <br><br><br><br><br><br><br><br><b>6GK1 901-1GA00</b>                                                                  |
| <b>MMC 128 KB <sup>1)</sup></b><br><br>for program backup                                                                                                                                                                                                                                                               | <b>6ES7 953-8LG20-0AA0</b>                                                   |                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                        |
| <b>MMC 512 KB <sup>1)</sup></b><br><br>for program backup                                                                                                                                                                                                                                                               | <b>6ES7 953-8LJ20-0AA0</b>                                                   |                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                        |
| <b>MMC 2 MB <sup>1)</sup></b><br><br>for program backup and/or firmware updates                                                                                                                                                                                                                                         | <b>6ES7 953-8LL20-0AA0</b>                                                   |                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                        |
| <b>MMC 4 MB <sup>1)</sup></b><br><br>for program backup                                                                                                                                                                                                                                                                 | <b>6ES7 953-8LM20-0AA0</b>                                                   |                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                        |
| <b>MMC 8 MB <sup>1)</sup></b><br><br>for program backup                                                                                                                                                                                                                                                                 | <b>6ES7 953-8LP20-0AA0</b>                                                   |                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                        |
| <b>Connection module</b><br><br>For CPU IM154-8 PN/DP, with 4 x M12 and 2 x 7/8", to connect PROFINET and PROFIBUS DP                                                                                                                                                                                                   | <b>6ES7 194-4AN00-0AA0</b>                                                   |                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                        |
| <b>SCALANCE X-200 Industrial Ethernet Switches</b><br><br>With integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics, for setting up linear, star and ring structures SCALANCE X208PRO, in degree of protection IP65, with eight 10/100 Mbit/s M12 ports, incl. eleven M12 dust caps | <b>6GK5 208-0HA00-2AA6</b>                                                   |                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                        |

<sup>1)</sup> An MMC is essential for operating the CPU



## SIMATIC ET 200 distributed I/O

## ET 200pro

Interface modules  
IM 154-8 F PN/DP CPU

## Ordering data

## Order No.

## Order No.

**IE Connecting Cable M12-180/  
M12-180**

Preassembled IE FC TP Trailing Cable GP 2 x 2 (PROFINET Type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, length:

0.3 m

**6XV1 870-8AE30**

0.5 m

**6XV1 870-8AE50**

1.0 m

**6XV1 870-8AH10**

1.5 m

**6XV1 870-8AH15**

2.0 m

**6XV1 870-8AH20**

3.0 m

**6XV1 870-8AH30**

5.0 m

**6XV1 870-8AH50**

10 m

**6XV1 870-8AN10**

15 m

**6XV1 870-8AN15**

PROFINET M12 connecting cable, trailing cable preassembled at both ends with angled M12 connectors (male insert)

3.0 m

F **3RK1 902-2NB30**

5.0 m

F **3RK1 902-2NB50**

10 m

F **3RK1 902-2NC10**

PROFINET M12 connecting cable, trailing cable preassembled at one end with angled M12 connector (male insert at one end, other end unconnected)

3.0 m

F **3RK1 902-2HB30**

5.0 m

F **3RK1 902-2HB50**

10 m

F **3RK1 902-2HC10****IE FC M12 Plug PRO**

PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet

1 unit

I **6GK1 901-0DB20-6AA0**

8 units

I **6GK1 901-0DB20-6AA8**

PROFINET M12 plug connector, D-coded, angled

**3RK1 902-2DA00****IE panel feedthrough**

Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units

I **6GK1 901-0DM20-2AA5****7/8" connecting cable to power supply**

5-core, 5 x 1.5 mm<sup>2</sup>, trailing type, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m

• 1.5 m long

• 2.0 m long

• 3.0 m long

• 5.0 m long

• 10 m long

• 15 m long

• Other special lengths with 90° or 180° cable outlet

**6XV1 822-5BH15****6XV1 822-5BH20****6XV1 822-5BH30****6XV1 822-5BH50****6XV1 822-5BN10****6XV1 822-5BN15**

See

[support.automation.siemens.com/WW/view/en/26999294](http://support.automation.siemens.com/WW/view/en/26999294)

Power cable, can be trailed, 5 x 1.5 mm<sup>2</sup>, preassembled at both ends with 7/8" angled connectors (female insert at one end, male insert at the other end)

• 3.0 m long

F

**3RK1 902-3NB30**

• 5.0 m long

F

**3RK1 902-3NB50**

• 10 m long

F

**3RK1 902-3NC10**

• Power cable, can be trailed, 5 x 1.5 mm<sup>2</sup>, preassembled at one end with 7/8" angled connector with female insert (female insert at one end, other end unconnected)

• 3.0 m long

F

**3RK1 902-3GB30**

• 5.0 m long

F

**3RK1 902-3GB50**

• 10 m long

F

**3RK1 902-3GC10****Power line****6XV1 830-8AH10**

5-core, 5 x 1.5 mm<sup>2</sup>, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m

**7/8" cable connector**

For ET 200eco, with axial cable outlet

• with male insert, 5 per pack

**6GK1 905-0FA00**

• with female insert, 5 per pack

**6GK1 905-0FB00**

• angled, with female insert, 1 unit

F

**3RK1 902-3DA00**

• angled, with male insert, 1 unit

F

**3RK1 902-3BA00**

7/8" cover cap, 10 per pack

**6ES7 194-3JA00-0AA0****Twisted Pair cables 4x2 with RJ45 connectors**

0.5 m long

**6XV1 870-3QE50**

1 m long

**6XV1 870-3QH10**

2 m long

**6XV1 870-3QH20**

6 m long

**6XV1 870-3QH60**

10 m long

**6XV1 870-3QN10**

F: Subject to export regulations AL: N and ECCN: EAR99

I: Subject to export regulations AL: N and ECCN: EAR99H

| Ordering data                                                                                                                         | Order No.                                                                                                                                          |                                                                                 | Order No.             |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-----------------------|
| <b>Crossed Twisted Pair cables<br/>4x2 with RJ45 connectors</b>                                                                       |                                                                                                                                                    | <b>PROFIBUS FC S<br/>standard Cable GP</b>                                      | <b>6XV1 830-0EH10</b> |
| 0.5 m long                                                                                                                            | <b>6XV1 870-3RE50</b>                                                                                                                              | Standard type specially designed<br>for fast assembly, 2-core,<br>shielded,     |                       |
| 1 m long                                                                                                                              | <b>6XV1 870-3RH10</b>                                                                                                                              | Sold by the meter;<br>Max. delivery unit 1000 m,<br>Minimum order quantity 20 m | <b>6XV1 830-3EH10</b> |
| 2 m long                                                                                                                              | <b>6XV1 870-3RH20</b>                                                                                                                              | <b>PROFIBUS FC Trailing Cable</b>                                               |                       |
| 6 m long                                                                                                                              | <b>6XV1 870-3RH60</b>                                                                                                                              | 2-core, shielded                                                                | <b>6XV1 830-0GH10</b> |
| 10 m long                                                                                                                             | <b>6XV1 870-3RN10</b>                                                                                                                              | <b>PROFIBUS FC Food Cable</b>                                                   |                       |
| <b>M12 sealing cap</b>                                                                                                                | <b>3RX9 802-0AA00</b>                                                                                                                              | 2-core, shielded                                                                | <b>6XV1 830-0JH10</b> |
| For protection of unused M12<br>connections with ET 200pro                                                                            |                                                                                                                                                    | Sold by the meter;<br>Max. delivery unit 1000 m,<br>Minimum order quantity 20 m |                       |
| <b>M12 sealing caps with female<br/>thread</b>                                                                                        | <b>6ES7 194-4JD60-0AA0</b>                                                                                                                         | <b>PROFIBUS FC Robust Cable</b>                                                 |                       |
| 5 units                                                                                                                               |                                                                                                                                                    | 2-core, shielded                                                                |                       |
| <b>PROFIBUS M12 connecting<br/>cable</b>                                                                                              |                                                                                                                                                    | Sold by the meter;<br>Max. delivery unit 1000 m,<br>Minimum order quantity 20 m |                       |
| Preassembled, with two 5-pole<br>M12 connectors/sockets, up to<br>100 m; length:                                                      |                                                                                                                                                    | <b>PROFIBUS M12 cable<br/>connector</b>                                         |                       |
| <ul style="list-style-type: none"><li>• 1.5 m</li><li>• 2.0 m</li><li>• 3.0 m</li><li>• 5.0 m</li><li>• 10 m</li><li>• 15 m</li></ul> | <b>6XV1 830-3DH15</b><br><b>6XV1 830-3DH20</b><br><b>6XV1 830-3DH30</b><br><b>6XV1 830-3DH50</b><br><b>6XV1 830-3DN10</b><br><b>6XV1 830-3DN15</b> | 5-pole, B-coded, metal casing,<br>1 pack = 5 units                              | <b>6GK1 905-0EB00</b> |
| Other special lengths with 90° or<br>180° cable outlet                                                                                | See<br><a href="http://support.automation.siemens.com/WW/view/en/26999294">http://<br/>support.automation.siemens.<br/>com/WW/view/en/26999294</a> | • Female insert                                                                 | <b>6GK1 905-0ED00</b> |
| M12 bus termination connector<br>for PROFIBUS, female insert                                                                          | <b>6GK1 905-0ED00</b>                                                                                                                              |                                                                                 |                       |
| M12 bus termination connector<br>for PROFIBUS, male insert                                                                            | <b>6GK1 905-0EC00</b>                                                                                                                              |                                                                                 |                       |
| M12 plug connector, axial outlet,<br>with male insert                                                                                 | <b>6GK1 905-0EA00</b>                                                                                                                              |                                                                                 |                       |

I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200pro

### I/O modules

### Digital expansion modules

#### Overview



- Expansion modules with digital inputs/outputs for connection of actuators/sensors
- With scalable diagnostics
  - Standard modules with module-specific diagnostics
  - High-feature module with channel-specific diagnostics and parameterizable input delay or hardware interrupts
- Double or single assignment can be implemented for each M12 in the case of the 8DI and 8DO module by selecting CM IO 4 x M12 or CM IO 8 x M12

#### Technical specifications

|                                                     | 6ES7 141-4BF00-0AA0                                                                   | 6ES7 141-4BF00-0AB0                       | 6ES7 141-4BH00-0AA0                                                                   |
|-----------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                              |                                                                                       |                                           |                                                                                       |
| Rated value                                         | Yes                                                                                   | Yes                                       | Yes                                                                                   |
| • 24 V DC                                           | 20.4 V                                                                                | 20.4 V                                    | 20.4 V                                                                                |
| • permissible range, lower limit (DC)               | 28.8 V                                                                                | 28.8 V                                    | 28.8 V                                                                                |
| • permissible range, upper limit (DC)               |                                                                                       |                                           |                                                                                       |
| • Reverse polarity protection                       | Yes; against destruction; encoder power supply outputs applied with reversed polarity | Yes; against destruction; load increasing | Yes; against destruction; encoder power supply outputs applied with reversed polarity |
| <b>Current consumption</b>                          |                                                                                       |                                           |                                                                                       |
| from backplane bus 3.3 V DC, max.                   | 20 mA                                                                                 | 40 mA                                     | 20 mA                                                                                 |
| from supply voltage 1L+, max.                       | 20 mA                                                                                 | 20 mA                                     | 30 mA                                                                                 |
| <b>Power losses</b>                                 |                                                                                       |                                           |                                                                                       |
| Power loss, typ.                                    | 2.5 W                                                                                 | 2.5 W                                     | 3 W                                                                                   |
| <b>Address area</b>                                 |                                                                                       |                                           |                                                                                       |
| Occupied address area                               |                                                                                       |                                           |                                                                                       |
| • Inputs                                            | 1 byte                                                                                | 1 byte                                    | 2 byte                                                                                |
| <b>FH technology</b>                                |                                                                                       |                                           |                                                                                       |
| Module for fail-safe applications                   | No                                                                                    | No                                        |                                                                                       |
| <b>Isochronous mode</b>                             |                                                                                       |                                           |                                                                                       |
| Isochronous mode                                    | No                                                                                    | No                                        |                                                                                       |
| <b>Digital inputs</b>                               |                                                                                       |                                           |                                                                                       |
| Number of digital inputs                            | 8                                                                                     | 8                                         | 16                                                                                    |
| Number of simultaneously controllable inputs        |                                                                                       |                                           |                                                                                       |
| • all mounting positions                            |                                                                                       |                                           |                                                                                       |
| - up to 55 °C, max.                                 | 8                                                                                     | 8                                         | 16                                                                                    |
| Input characteristic curve acc. to IEC 1131, Type 1 | Yes                                                                                   | No                                        | Yes                                                                                   |
| Input characteristic curve acc. to IEC 1131, Type 2 | No                                                                                    | Yes                                       |                                                                                       |
| Input voltage                                       |                                                                                       |                                           |                                                                                       |
| • Rated value, DC                                   | 24 V                                                                                  | 24 V                                      | 24 V                                                                                  |
| • for signal "0"                                    | -3 to +5 V                                                                            | -3 to +5 V                                | -3 to +5 V                                                                            |
| • for signal "1"                                    | 13 to 30 V                                                                            | 11 to 30 V                                | 11 to 30 V                                                                            |
| Input current                                       |                                                                                       |                                           |                                                                                       |
| • for signal "1", typ.                              | 7 mA                                                                                  | 7 mA                                      | 4 mA                                                                                  |

**Technical specifications** (continued)

|                                                                       | 6ES7 141-4BF00-0AA0                       | 6ES7 141-4BF00-0AB0                      | 6ES7 141-4BH00-0AA0                       |
|-----------------------------------------------------------------------|-------------------------------------------|------------------------------------------|-------------------------------------------|
| Input delay<br>(for rated value of input voltage)                     |                                           |                                          |                                           |
| • for standard inputs                                                 | No                                        | Yes                                      | No                                        |
| - parameterizable                                                     | 1.2 ms                                    | 0.5 ms; 0.5 ms/ 3ms/ 15 ms/ 20 ms        | 1.2 ms                                    |
| - at "0" to "1", min.                                                 | 4.8 ms                                    | 20 ms                                    | 4.8 ms                                    |
| - at "0" to "1", max.                                                 | 1.2 ms                                    | 0.5 ms; 0.5 ms/3 ms/15 ms/20 ms          | 0.7 ms                                    |
| - at "1" to "0", min.                                                 | 4.8 ms                                    | 20 ms                                    | 3 ms                                      |
| - at "1" to "0", max.                                                 |                                           |                                          |                                           |
| Cable length                                                          |                                           |                                          |                                           |
| • Cable length, shielded, max.                                        | 30 m                                      | 30 m                                     | 30 m                                      |
| • Cable length unshielded, max.                                       | 30 m                                      | 30 m                                     | 30 m                                      |
| <b>Encoder supply</b>                                                 |                                           |                                          |                                           |
| Number of outputs                                                     | 8                                         | 8                                        | 8                                         |
| Output current                                                        |                                           |                                          |                                           |
| • up to 55 °C, max.                                                   | 1 A                                       | 1 A                                      | 1 A                                       |
| <b>Encoder</b>                                                        |                                           |                                          |                                           |
| Connectable encoders                                                  |                                           |                                          |                                           |
| • 2-wire BEROs                                                        | Yes                                       | Yes                                      | Yes                                       |
| - permissible quiescent current<br>(2-wire BEROs), max.               | 1.5 mA                                    | 1.5 mA                                   | 1.5 mA                                    |
| <b>Parameter</b>                                                      |                                           |                                          |                                           |
| Diagnostic alarm                                                      |                                           | yes                                      |                                           |
| Process alarm                                                         |                                           | for 6 channels                           |                                           |
| Diagnostics: wire break                                               |                                           | channel by channel                       |                                           |
| Diagnostics: short circuit                                            | Sensor supply to M; module by module      | channel by channel                       |                                           |
| <b>Alarms/diagnostics/status information</b>                          |                                           |                                          |                                           |
| Diagnostics                                                           |                                           |                                          |                                           |
| • Diagnostic functions                                                | Yes                                       | Yes; channel by channel, parameterizable | Yes                                       |
| • Diagnostic information readable                                     | Yes                                       | Yes                                      | Yes                                       |
| • Wire break                                                          |                                           | Yes; monitoring, $I < 0.3 \text{ mA}$    |                                           |
| • Short circuit                                                       | Yes; Sensor supply to M; module by module | Yes                                      | Yes; sensor supply to M; module by module |
| • Group error                                                         |                                           |                                          | Yes                                       |
| diagnostic indication LED                                             |                                           |                                          |                                           |
| • Group error SF (red)                                                | Yes                                       | Yes                                      | Yes                                       |
| • Status indicator digital input (green)                              | Yes; per channel                          | Yes; per channel                         | Yes; per channel                          |
| <b>Isolation</b>                                                      |                                           |                                          |                                           |
| Isolation checked with                                                | 500 V DC                                  | 500 V DC                                 | 500 V DC                                  |
| <b>Galvanic isolation</b>                                             |                                           |                                          |                                           |
| Galvanic isolation digital inputs                                     |                                           |                                          |                                           |
| • between the channels                                                | No                                        | No                                       | No                                        |
| • between the channels and the backplane bus                          | Yes                                       | Yes                                      | Yes                                       |
| <b>Permissible potential difference</b><br>between different circuits | 75 V DC / 60 V AC                         | 75 V DC / 60 V AC                        | 75 V DC / 60 V AC                         |
| <b>Degree of protection</b>                                           |                                           |                                          |                                           |
| IP65                                                                  | Yes                                       | Yes                                      |                                           |
| IP66                                                                  | Yes                                       | Yes                                      |                                           |
| IP67                                                                  | Yes                                       | Yes                                      | Yes                                       |
| <b>Dimensions and weight</b>                                          |                                           |                                          |                                           |
| Dimensions                                                            |                                           |                                          |                                           |
| • Width                                                               | 45 mm                                     | 45 mm                                    | 45 mm                                     |
| • Height                                                              | 130 mm                                    | 130 mm                                   | 130 mm                                    |
| • Depth                                                               | 35 mm                                     | 35 mm; without terminal module           | 35 mm                                     |
| Weight                                                                |                                           |                                          |                                           |
| • Weight, approx.                                                     | 140 g                                     | 140 g                                    | 140 g                                     |

## SIMATIC ET 200 distributed I/O

## ET 200pro

## I/O modules

## Digital expansion modules

## Technical specifications (continued)

| 6ES7 142-4BF00-0AA0                                                                                                             |                                                                                   |                                                                                   |                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Supply voltages</b><br>Load voltage 2L+<br>• Rated value (DC)<br>• Short-circuit protection<br>• Reverse polarity protection | 24 V<br>Yes; per channel, electronic<br>Yes; against destruction; load increasing | 24 V<br>Yes; per channel, electronic<br>Yes; against destruction; load increasing | 24 V<br>Yes; per channel, electronic<br>Yes; against destruction; load increasing   |
| <b>Current consumption</b><br>from load voltage 2L+ (without load), max.                                                        | 20 mA                                                                             | 40 mA                                                                             | 30 mA                                                                               |
| from backplane bus 3.3 V DC, max.                                                                                               | 20 mA                                                                             | 40 mA                                                                             | 30 mA                                                                               |
| <b>Power losses</b><br>Power loss, typ.                                                                                         | 2 W                                                                               | 2.5 W                                                                             | 2 W                                                                                 |
| <b>Address area</b><br>Address space per module<br>• with packing<br>• without packing                                          | 4 bit<br>1 byte                                                                   | 4 bit<br>1 byte                                                                   | 8 bit<br>1 byte                                                                     |
| <b>FH technology</b><br>Module for fail-safe applications                                                                       | No                                                                                | No                                                                                | No                                                                                  |
| <b>Digital outputs</b><br>Number of digital outputs                                                                             | 4                                                                                 | 4                                                                                 | 8                                                                                   |
| Short-circuit protection<br>• Response threshold, typ.                                                                          | Yes; per channel, electronic<br>3                                                 | Yes; per channel, electronic<br>3                                                 | Yes; per channel, electronic<br>0.7                                                 |
| Limitation of inductive shutdown voltage to                                                                                     | 2L+ (-47 V)                                                                       | 2L+ (-47 V)                                                                       | 2L+ (-47 V)                                                                         |
| Lamp load, max.                                                                                                                 | 10 W                                                                              | 10 W                                                                              | 5 W                                                                                 |
| Controlling a digital input                                                                                                     | Yes                                                                               | Yes                                                                               | Yes; isolation between 1L+ and 2L+ is no longer provided, as 1M and 2M are jumpered |
| Output voltage<br>• for signal "1", min.                                                                                        | 2L+ (-0.8 V)                                                                      | 2L+ (-0.8 V)                                                                      | 2L+ (-0.8 V)                                                                        |
| Output current<br>• for signal "1" rated value<br>• for signal "0" residual current, max.                                       | 2 A<br>0.5 mA                                                                     | 2 A<br>0.5 mA                                                                     | 0.5 A<br>0.5 mA                                                                     |
| Parallel switching of 2 outputs<br>• for increased power<br>• for redundant control of a load                                   | No<br>Yes                                                                         | No<br>Yes                                                                         | No<br>Yes                                                                           |
| Switching frequency<br>• with resistive load, max.<br>• with inductive load, max.<br>• on lamp load, max.                       | 100 Hz<br>0.5 Hz<br>1 Hz                                                          | 100 Hz<br>0.5 Hz<br>1 Hz                                                          | 100 Hz<br>0.5 Hz<br>1 Hz                                                            |
| Aggregate current of outputs (per group)<br>• up to 55 °C, max.                                                                 | 4 A                                                                               | 4 A                                                                               | 4 A                                                                                 |
| Load resistance range<br>• lower limit<br>• upper limit                                                                         | 12 Ω<br>4 kΩ                                                                      | 12 Ω<br>4 kΩ                                                                      | 48 Ω<br>4 kΩ                                                                        |
| Cable length<br>• Cable length, shielded, max.<br>• Cable length unshielded, max.                                               | 30 m<br>30 m                                                                      | 30 m<br>30 m                                                                      | 30 m<br>30 m                                                                        |

## Technical specifications (continued)

| 6ES7 142-4BF00-0AA0                                    |                                                      |                                |                                                      |
|--------------------------------------------------------|------------------------------------------------------|--------------------------------|------------------------------------------------------|
| <b>Parameter</b>                                       |                                                      |                                |                                                      |
| Diagnostics: wire break                                |                                                      | channel by channel             |                                                      |
| Diagnostics: short circuit                             |                                                      | channel by channel             |                                                      |
| Behavior on CPU/Master STOP                            |                                                      | channel by channel             |                                                      |
| <b>Alarms/diagnostics/status information</b>           |                                                      |                                |                                                      |
| Substitute values connectable                          |                                                      | Yes                            |                                                      |
| <b>Alarms</b>                                          |                                                      |                                |                                                      |
| • Diagnostic alarm                                     |                                                      | Yes                            |                                                      |
| <b>Diagnostics</b>                                     |                                                      |                                |                                                      |
| • Diagnostic functions                                 | Yes                                                  | Yes                            | Yes                                                  |
| • Diagnostic information readable                      | Yes                                                  | Yes                            | Yes                                                  |
| • Wire break                                           |                                                      | Yes                            |                                                      |
| • Short circuit                                        | Yes; short-circuit of outputs to M; module by module | Yes                            | Yes; short-circuit of outputs to M; module by module |
| <b>Diagnostic indication LED</b>                       |                                                      |                                |                                                      |
| • Group error SF (red)                                 | Yes                                                  | Yes                            | Yes                                                  |
| • Status indicator digital output (green)              | Yes                                                  | Yes                            | Yes                                                  |
| • Channel error indicator F (red)                      |                                                      | Yes                            |                                                      |
| <b>Isolation</b>                                       |                                                      |                                |                                                      |
| Isolation checked with                                 | 500 V DC                                             | 500 V DC                       | 500 V DC                                             |
| <b>Galvanic isolation</b>                              |                                                      |                                |                                                      |
| between backplane bus and all other circuit components |                                                      | Yes                            |                                                      |
| between the channels and backplane bus                 |                                                      | Yes                            |                                                      |
| <b>Galvanic isolation digital outputs</b>              |                                                      |                                |                                                      |
| • between the channels                                 | No                                                   | No                             | No                                                   |
| • between the channels and the backplane bus           | Yes                                                  | Yes                            | Yes                                                  |
| <b>Permissible potential difference</b>                |                                                      |                                |                                                      |
| between different circuits                             |                                                      | 75 V DC / 60 V AC              |                                                      |
| <b>Dimensions and weight</b>                           |                                                      |                                |                                                      |
| <b>Dimensions</b>                                      |                                                      |                                |                                                      |
| • Width                                                | 45 mm                                                | 45 mm                          | 45 mm                                                |
| • Height                                               | 130 mm                                               | 130 mm                         | 130 mm                                               |
| • Depth                                                | 35 mm                                                | 35 mm; without terminal module | 35 mm                                                |
| <b>Weight</b>                                          |                                                      |                                |                                                      |
| • Weight, approx.                                      | 140 g                                                | 140 g                          | 140 g                                                |

## SIMATIC ET 200 distributed I/O

## ET 200pro

## I/O modules

## Digital expansion modules

## Technical specifications (continued)

| 6ES7 143-4BF00-0AA0                                    |                                      |
|--------------------------------------------------------|--------------------------------------|
| <b>Supply voltages</b>                                 |                                      |
| Rated value                                            |                                      |
| • 24 V DC                                              | Yes                                  |
| • permissible range, lower limit (DC)                  | 20.4 V                               |
| • permissible range, upper limit (DC)                  | 28.8 V                               |
| • Reverse polarity protection                          | Yes                                  |
| Load voltage 2L+                                       |                                      |
| • Rated value (DC)                                     | 24 V                                 |
| • permissible range, lower limit (DC)                  | 20.4 V                               |
| • permissible range, upper limit (DC)                  | 28.8 V                               |
| • Reverse polarity protection                          | Yes                                  |
| <b>Current consumption</b>                             |                                      |
| from load voltage 1L+ (unswitched voltage)             | 20 mA                                |
| from load voltage 2L+, max.                            | 20 mA                                |
| <b>Power losses</b>                                    |                                      |
| Power loss, typ.                                       | 3 W                                  |
| <b>Digital inputs</b>                                  |                                      |
| Number of digital inputs                               | 4                                    |
| Number of simultaneously control-able inputs           |                                      |
| • all mounting positions                               |                                      |
| - Concurrently controllable inputs, up to 60 °C        | 4; Up to 55 °C                       |
| Input characteristic curve acc. to IEC 1131, Type 3    | Yes                                  |
| Input voltage                                          |                                      |
| • Rated value, DC                                      | 24 V                                 |
| • for signal "0"                                       | -3 to +5 V                           |
| • for signal "1"                                       | 11 to 30 V                           |
| Input current                                          |                                      |
| • for signal "0", max. (permissible quiescent current) | 1.5 mA                               |
| • for signal "1", typ.                                 | 7 mA                                 |
| Input delay (for rated value of input voltage)         |                                      |
| • for standard inputs                                  |                                      |
| - at "0" to "1", max.                                  | 4.8 ms                               |
| - at "1" to "0", max.                                  | 4.8 ms                               |
| Cable length                                           |                                      |
| • Cable length unshielded, max.                        | 30 m                                 |
| <b>Digital outputs</b>                                 |                                      |
| Number of digital outputs                              | 8; 4 DO fixed, 4 DIO parameterizable |
| • in groups of                                         | 2                                    |
| Short-circuit protection                               | Yes; per channel, electronic         |
| • Response threshold, typ.                             | 0.7 A                                |
| Limitation of inductive shutdown voltage to            | Typ. (L1+, L2+) -47 V                |

| 6ES7 143-4BF00-0AA0                                     |                                                           |
|---------------------------------------------------------|-----------------------------------------------------------|
| Switching capacity of the outputs                       |                                                           |
| • on lamp load, max.                                    | 5 W                                                       |
| Controlling a digital input                             | Yes                                                       |
| Output current                                          |                                                           |
| • for signal "1" rated value                            | 0.5 A                                                     |
| • for signal "0" residual current, max.                 | 0.5 mA                                                    |
| Parallel switching of 2 outputs                         |                                                           |
| • for increased power                                   | No                                                        |
| • for redundant control of a load                       | Yes                                                       |
| Switching frequency                                     |                                                           |
| • with resistive load, max.                             | 100 Hz                                                    |
| • with inductive load, max.                             | 0.5 Hz                                                    |
| • on lamp load, max.                                    | 1 Hz                                                      |
| Aggregate current of outputs (per group)                |                                                           |
| • up to 55 °C, max.                                     | 2 A                                                       |
| Cable length                                            |                                                           |
| • Cable length unshielded, max.                         | 30 m                                                      |
| <b>Encoder supply</b>                                   |                                                           |
| Number of outputs                                       | 4                                                         |
| Output current, rated value                             | 1 A                                                       |
| 24 V encoder supply                                     |                                                           |
| • Short-circuit protection                              | Yes                                                       |
| <b>Alarms/diagnostics/status information</b>            |                                                           |
| Status indicator                                        | Yes; Green LED                                            |
| Alarms                                                  |                                                           |
| • Diagnostic alarm                                      | Yes                                                       |
| Diagnostics                                             |                                                           |
| • Diagnostic functions                                  | Yes                                                       |
| • Diagnostic information readable                       | Yes                                                       |
| • Short circuit                                         | Yes; short-circuit of outputs to ground; module by module |
| • Short circuit encoder supply                          | Yes; per module                                           |
| • Group error                                           | Yes                                                       |
| <b>Isolation</b>                                        |                                                           |
| tested with                                             |                                                           |
| • 24 V DC circuits                                      | 500 V                                                     |
| <b>Galvanic isolation</b>                               |                                                           |
| between the load voltages                               | Yes                                                       |
| between load voltage and all other switching components | Yes                                                       |
| Galvanic isolation digital inputs                       |                                                           |
| • between the channels                                  | No                                                        |
| <b>Permissible potential difference</b>                 |                                                           |
| between different circuits                              | 75 V DC/60 V AC                                           |
| <b>Dimensions and weight</b>                            |                                                           |
| Dimensions                                              |                                                           |
| • Width                                                 | 45 mm                                                     |
| • Height                                                | 130 mm                                                    |
| • Depth                                                 | 35 mm                                                     |
| Weight                                                  |                                                           |
| • Weight                                                | 140 g                                                     |

| Ordering data                                                                                                                                                                         | Order No.                  |                                                                                                                                             | Order No.                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>8 DI digital input module</b><br>24 V DC, with module-specific diagnostics, including bus module. Connection module must be ordered separately                                     | <b>6ES7 141-4BF00-0AA0</b> | <b>CM IO 8 x M12 connection module</b><br>8 M12 sockets for connecting digital sensors or actuators to ET 200pro                            | <b>6ES7 194-4CB00-0AA0</b> |
| <b>8 DI High Feature digital input module</b><br>24 V DC, with channel-specific diagnostics, including bus module. Connection module must be ordered separately                       | <b>6ES7 141-4BF00-0AB0</b> | <b>CM IO 8 x M12D connection module</b><br>8 M12 sockets for connecting digital sensors or actuators to ET 200pro                           | <b>6ES7 194-4CB50-0AA0</b> |
| <b>16 DI digital input module</b><br>24 V DC, with module-specific diagnostics, including bus module. Connection module 6ES7 194-4CB50-0AA0 must be ordered separately                | <b>6ES7 141-4BH00-0AA0</b> | <b>CM IO 8 x M8 connection module</b><br>8 sockets M8 for connection of digital sensors or actuators to ET 200pro                           | <b>6ES7 194-4EB00-0AA0</b> |
| <b>4 DO digital output module</b><br>24 V DC, 2 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately                               | <b>6ES7 142-4BD00-0AA0</b> | <b>CM IO 2 x M12 connection module</b><br>2 M12 8-pin sockets; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A                       | <b>6ES7 194-4FB00-0AA0</b> |
| <b>4 DO High Feature digital output module</b><br>24 V DC, 2 A, with channel-specific diagnostics, including bus module. Connection module must be ordered separately                 | <b>6ES7 142-4BD00-0AB0</b> | <b>CM IO 1 x M23 connection module</b><br>1 socket M23; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A                              | <b>6ES7 194-4FA00-0AA0</b> |
| <b>8 DO digital output module</b><br>24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately                             | <b>6ES7 142-4BF00-0AA0</b> | <b>Module identification labels</b><br>For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each | <b>6ES7 194-4HA00-0AA0</b> |
| <b>Digital input and output module 4 DIO / 4 DO</b><br>24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately           | <b>6ES7 143-4BF00-0AA0</b> | <b>M12 sealing cap</b><br>For protection of unused M12 connections with ET 200pro                                                           | <b>3RX9 802-0AA00</b>      |
| <b>Accessories</b>                                                                                                                                                                    |                            | <b>Labels</b><br>20 x 7, pale turquoise, 340 units per pack                                                                                 | <b>3RT1 900-1SB20</b>      |
| <b>CM IO 4 x M12 connection module</b><br>4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro                                                            | <b>6ES7 194-4CA00-0AA0</b> | <b>Y circular connector M12</b><br>For double connection of sensors via a single cable, 5-pole; cannot be used for F DI 4/8                 | <b>6ES7 194-1KA01-0XA0</b> |
| <b>CM IO 4 x M12 inverse connection module</b><br>4 sockets M12 for connection of digital actuators to ET 200pro (4 DO and 4 DO HF); 2 x M12 singly occupied, 2 x M12 doubly occupied | <b>6ES7 194-4CA50-0AA0</b> | <b>Y cable M12</b><br>For double connection of I/O by means of a single-cable on ET200, 5-pole                                              | <b>6ES7 194-6KA00-0XA0</b> |
|                                                                                                                                                                                       |                            | <b>M8 sealing cap</b><br>For IP 67 modules                                                                                                  | <b>3RK1 901-1PN00</b>      |

I: Subject to export regulations AL: N and ECCN: EAR99H



## SIMATIC ET 200 distributed I/O

## ET 200pro

## I/O modules

## Analog expansion modules

## Overview



- Expansion modules with analog inputs and outputs for connecting sensors/actuators
- With diagnostic functionality, limit values and substitute values

## Technical specifications

|                                                                    | 6ES7 144-4FF00-0AB0      | 6ES7 144-4GF00-0AB0      | 6ES7 144-4JF00-0AB0                                 | 6ES7 144-4PF00-0AB0                                          |
|--------------------------------------------------------------------|--------------------------|--------------------------|-----------------------------------------------------|--------------------------------------------------------------|
| <b>Supply voltages</b>                                             |                          |                          |                                                     |                                                              |
| Load voltage L+                                                    |                          |                          |                                                     |                                                              |
| • Rated value (DC)                                                 | 24 V                     | 24 V                     | 24 V                                                | 24 V                                                         |
| • Reverse polarity protection                                      | Yes; against destruction | Yes; against destruction | Yes; against destruction                            | Yes; against destruction                                     |
| <b>Current consumption</b>                                         |                          |                          |                                                     |                                                              |
| from load voltage L+ (without load), max.                          |                          |                          |                                                     | 34 mA; typ.                                                  |
| from backplane bus 3.3 V DC, max.                                  | 10 mA                    | 10 mA                    | 10 mA; typically                                    | 20 mA; typically                                             |
| <b>Power losses</b>                                                |                          |                          |                                                     |                                                              |
| Power loss, typ.                                                   | 1.1 W                    | 1.1 W                    | 0.7 W                                               | 0.7 W                                                        |
| <b>Address area</b>                                                |                          |                          |                                                     |                                                              |
| Address space per module                                           |                          |                          |                                                     |                                                              |
| • Address space per module, max.                                   | 8 byte                   | 8 byte                   | 8 byte                                              | 8 byte                                                       |
| <b>Analog inputs</b>                                               |                          |                          |                                                     |                                                              |
| Number of analog inputs                                            | 4                        | 4                        | 4                                                   | 4                                                            |
| Cable length, shielded, max.                                       | 30 m                     | 30 m                     | 30 m                                                | 30 m                                                         |
| Constant measurement current for resistance-type transmitter, typ. |                          |                          | 1.25 mA; 1.25 / 0.5 mA depending on measuring range |                                                              |
| Cycle time (all channels) max.                                     | 267 ms                   | 267 ms                   | 83 ms; 83 ms at 50 Hz; 69 ms at 60 Hz               | Number of active channels per module x basic conversion time |
| Technical unit for temperature measurement adjustable              |                          |                          | Yes                                                 |                                                              |
| <b>Input ranges</b>                                                |                          |                          |                                                     |                                                              |
| • Voltage                                                          | Yes                      | Yes                      | No                                                  | Yes                                                          |
| • Current                                                          | No                       | Yes                      | No                                                  |                                                              |
| • Thermocouple                                                     | No                       | No                       | No                                                  | Yes                                                          |
| • Resistance thermometer                                           | No                       | No                       | Yes                                                 |                                                              |
| • Resistance                                                       | No                       | No                       | Yes                                                 |                                                              |

**Technical specifications** (continued)

|                                                         | 6ES7 144-4FF00-0AB0 | 6ES7 144-4GF00-0AB0 | 6ES7 144-4JF00-0AB0 | 6ES7 144-4PF00-0AB0 |
|---------------------------------------------------------|---------------------|---------------------|---------------------|---------------------|
| Input ranges (rated values),<br>voltages                |                     |                     |                     |                     |
| • 1 to 5 V                                              | Yes                 |                     |                     |                     |
| • -10 V to +10 V                                        | Yes                 |                     |                     |                     |
| • Input resistance<br>(-10 V to +10 V)                  | 100 k $\Omega$      |                     |                     |                     |
| • -5 V to +5 V                                          | Yes                 |                     |                     |                     |
| • -80 mV to +80 mV                                      |                     |                     |                     | Yes                 |
| • Input resistance<br>(-80 mV to +80 mV)                |                     |                     |                     | 10 M $\Omega$       |
| Input ranges (rated values),<br>currents                |                     |                     |                     |                     |
| • -20 to +20 mA                                         |                     | Yes                 |                     |                     |
| • Input resistance<br>(-20 to +20 mA)                   |                     | 50 $\Omega$         |                     |                     |
| • 4 to 20 mA                                            |                     | Yes                 |                     |                     |
| • Input resistance<br>(4 to 20 mA)                      |                     | 50 $\Omega$         |                     |                     |
| Input ranges (rated values),<br>thermoelements          |                     |                     |                     |                     |
| • Type B                                                |                     |                     |                     | Yes                 |
| • Input resistance (Type B)                             |                     |                     |                     | 10 M $\Omega$       |
| • Type E                                                |                     |                     |                     | Yes                 |
| • Input resistance (Type E)                             |                     |                     |                     | 10 M $\Omega$       |
| • Type J                                                |                     |                     |                     | Yes                 |
| • Input resistance (type J)                             |                     |                     |                     | 10 M $\Omega$       |
| • Type K                                                |                     |                     |                     | Yes                 |
| • Input resistance (Type K)                             |                     |                     |                     | 10 M $\Omega$       |
| • Type L                                                |                     |                     |                     | Yes                 |
| • Input resistance (Type L)                             |                     |                     |                     | 10 M $\Omega$       |
| • Type N                                                |                     |                     |                     | Yes                 |
| • Input resistance (Type N)                             |                     |                     |                     | 10 M $\Omega$       |
| • Type R                                                |                     |                     |                     | Yes                 |
| • Input resistance (Type R)                             |                     |                     |                     | 10 M $\Omega$       |
| • Type S                                                |                     |                     |                     | Yes                 |
| • Input resistance (Type S)                             |                     |                     |                     | 10 M $\Omega$       |
| • Type T                                                |                     |                     |                     | Yes                 |
| • Input resistance (Type T)                             |                     |                     |                     | 10 M $\Omega$       |
| Input ranges (rated values),<br>resistance thermometers |                     |                     |                     |                     |
| • Cu 10                                                 |                     |                     | No                  |                     |
| • Ni 100                                                |                     |                     | Yes                 |                     |
| • Input resistance (Ni 100)                             |                     |                     | 10 000 k $\Omega$   |                     |
| • Ni 1000                                               |                     |                     | Yes                 |                     |
| • Input resistance (Ni 1000)                            |                     |                     | 10 000 k $\Omega$   |                     |
| • Ni 120                                                |                     |                     | Yes                 |                     |
| • Input resistance (Ni 120)                             |                     |                     | 10 000 k $\Omega$   |                     |
| • Ni 200                                                |                     |                     | Yes                 |                     |
| • Input resistance (Ni 200)                             |                     |                     | 10 000 k $\Omega$   |                     |

## SIMATIC ET 200 distributed I/O

## ET 200pro

## I/O modules

## Analog expansion modules

## Technical specifications (continued)

|                                                                                 | 6ES7 144-4FF00-0AB0                                                     | 6ES7 144-4GF00-0AB0                                           | 6ES7 144-4JF00-0AB0                                                  | 6ES7 144-4PF00-0AB0 |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------|---------------------|
| Input ranges (rated values),<br>resistance thermometers                         |                                                                         |                                                               |                                                                      |                     |
| • Ni 500                                                                        |                                                                         |                                                               | Yes                                                                  |                     |
| • Input resistance (Ni 500)                                                     |                                                                         |                                                               | 10 000 kΩ                                                            |                     |
| • Pt 100                                                                        |                                                                         |                                                               | Yes                                                                  |                     |
| • Input resistance (Pt 100)                                                     |                                                                         |                                                               | 10 000 kΩ                                                            |                     |
| • Pt 1000                                                                       |                                                                         |                                                               | Yes                                                                  |                     |
| • Input resistance (Pt 1000)                                                    |                                                                         |                                                               | 10 000 kΩ                                                            |                     |
| • Pt 200                                                                        |                                                                         |                                                               | Yes                                                                  |                     |
| • Input resistance (Pt 200)                                                     |                                                                         |                                                               | 10 000 kΩ                                                            |                     |
| • Pt 500                                                                        |                                                                         |                                                               | Yes                                                                  |                     |
| • Input resistance (Pt 500)                                                     |                                                                         |                                                               | 10 000 kΩ                                                            |                     |
| Input ranges (rated values),<br>resistors                                       |                                                                         |                                                               |                                                                      |                     |
| • 0 to 150 Ohm                                                                  |                                                                         |                                                               | Yes                                                                  |                     |
| • Input resistance<br>(0 to 150 Ohm)                                            |                                                                         |                                                               | 10 000 kΩ                                                            |                     |
| • 0 to 300 Ohm                                                                  |                                                                         |                                                               | Yes                                                                  |                     |
| • Input resistance<br>(0 to 300 Ohm)                                            |                                                                         |                                                               | 10 000 kΩ                                                            |                     |
| • 0 to 600 Ohm                                                                  |                                                                         |                                                               | Yes                                                                  |                     |
| • Input resistance<br>(0 to 600 Ohm)                                            |                                                                         |                                                               | 10 000 kΩ                                                            |                     |
| • 0 to 3000 Ohm                                                                 |                                                                         |                                                               | Yes                                                                  |                     |
| • Input resistance<br>(0 to 3000 Ohm)                                           |                                                                         |                                                               | 10 000 kΩ                                                            |                     |
| Voltage input                                                                   |                                                                         |                                                               |                                                                      |                     |
| • permissible input voltage<br>for voltage input<br>(destruction limit), max.   | 35 V                                                                    |                                                               |                                                                      | 20 V                |
| Current input                                                                   |                                                                         |                                                               |                                                                      |                     |
| • permissible input current<br>for current input<br>(destruction limit), max.   |                                                                         | 40 mA                                                         |                                                                      |                     |
| Characteristic linearization                                                    |                                                                         |                                                               |                                                                      |                     |
| • parameterizable                                                               |                                                                         |                                                               | Yes                                                                  |                     |
| • for resistance thermometer                                                    |                                                                         |                                                               | Ptxxx, Nixxx                                                         |                     |
| Temperature compensation                                                        |                                                                         |                                                               |                                                                      |                     |
| • internal temperature<br>compensation                                          |                                                                         |                                                               |                                                                      | Yes                 |
| • external temperature<br>compensation with<br>compensations socket             |                                                                         |                                                               |                                                                      | Yes                 |
| <b>Analog value creation</b>                                                    |                                                                         |                                                               |                                                                      |                     |
| Measurement principle                                                           | integrating                                                             | integrating                                                   | integrating                                                          | integrating         |
| Integrations and conversion<br>time/ resolution per channel                     |                                                                         |                                                               |                                                                      |                     |
| • Resolution with overrange<br>(bit including sign), max.                       | 15 bit; at +/- 10 V, at +/- 5 V;<br>14 bit at 0 to 10 V, at 1 to<br>5 V | 15 bit; at +/- -20 mA;<br>14 bit at 0 to 20 mA, 4 to<br>20 mA | 15 bit; at 150, 300, 600<br>und 3000 Ohm; otherwise<br>15 bit + sign | 15 bit; + sign      |
| • Integration time, ms                                                          | 20 / 16,667                                                             | 20 / 16,667                                                   | 20 / 16,667                                                          | 2.5/16.67/20/100 ms |
| • Interference voltage<br>suppression for<br>interference frequency<br>f1 in Hz | 50/60 Hz                                                                | 50/60 Hz                                                      | 50/60 Hz                                                             | 10/50/60/400 Hz     |
| • Conversion time<br>(per channel)                                              | 67 ms                                                                   | 67 ms                                                         | 20.625 ms; 20.625 ms at<br>50 Hz; 17.25 ms at 60 Hz                  | 4.7/19/22/102 ms    |

**Technical specifications** (continued)

|                                                                                                           | 6ES7 144-4FF00-0AB0                  | 6ES7 144-4GF00-0AB0                  | 6ES7 144-4JF00-0AB0                     | 6ES7 144-4PF00-0AB0                |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------|-----------------------------------------|------------------------------------|
| Smoothing of measured values                                                                              |                                      |                                      |                                         |                                    |
| • parameterizable                                                                                         | Yes                                  | Yes                                  | Yes                                     | Yes                                |
| • Step: None                                                                                              | Yes; 1 x cycle time                  | Yes; 1 x cycle time                  | Yes; 1 x cycle time                     | Yes; 1 x cycle time                |
| • Step: Low                                                                                               | Yes; 4 x cycle time                  | Yes; 4 x cycle time                  | Yes; 4 x cycle time                     | Yes; 4 x cycle time                |
| • Step: Medium                                                                                            | Yes; 16 x cycle time                 | Yes; 16 x cycle time                 | Yes; 16 x cycle time                    | Yes; 16 x cycle time               |
| • Step: High                                                                                              | Yes; 64 x cycle time                 | Yes; 64 x cycle time                 | Yes; 64 x cycle time                    | Yes; 64 x cycle time               |
| <b>Encoder supply</b>                                                                                     |                                      |                                      |                                         |                                    |
| Short-circuit protection                                                                                  | Yes; per module, electronic to frame | Yes; per module, electronic to frame |                                         |                                    |
| <b>Encoder</b>                                                                                            |                                      |                                      |                                         |                                    |
| Connection of signal encoders                                                                             |                                      |                                      |                                         |                                    |
| • for current measurement as 2-wire transducer                                                            |                                      | Yes                                  |                                         |                                    |
| • for current measurement as 4-wire transducer                                                            |                                      | Yes                                  |                                         |                                    |
| • for resistance measurement with 2-conductor connection                                                  |                                      |                                      | Yes; line resistances are also measured |                                    |
| • for resistance measurement with 3-conductor connection                                                  |                                      |                                      | Yes                                     |                                    |
| • for resistance measurement with 4-conductor connection                                                  |                                      |                                      | Yes                                     |                                    |
| <b>Errors/accuracies</b>                                                                                  |                                      |                                      |                                         |                                    |
| Linearity error (relative to input area)                                                                  | +/- 0.01 %                           | +/- 0.01 %                           | +/- 0.05 %                              |                                    |
| Temperature error (relative to input area)                                                                | +/- 0.002 %/K                        | +/- 0.002 %/K                        | +/- 0.002 %/K                           | Positive temperature               |
| Crosstalk between the inputs, min.                                                                        | -50 dB                               | -50 dB                               | -50 dB                                  | -90 dB; max.                       |
| Repeat accuracy in settled status at 25 °C (relative to input area)                                       | +/- 0.025 %                          | +/- 0.025 %                          | +/- 0.015 %                             |                                    |
| Operational limit in overall temperature range                                                            |                                      |                                      |                                         |                                    |
| • Voltage, relative to input area                                                                         | +/- 0.15 %                           |                                      |                                         | Positive temperature               |
| • Current, relative to input area                                                                         |                                      | +/- 0.15 %                           |                                         |                                    |
| • Resistance-type thermometer, relative to input area                                                     |                                      |                                      | +/- 0.175 %                             |                                    |
| Basic error limit (operational limit at 25 °C)                                                            |                                      |                                      |                                         |                                    |
| • Voltage, relative to input area                                                                         | +/- 0.1 %                            |                                      |                                         |                                    |
| • Current, relative to input area                                                                         |                                      | +/- 0.1 %                            |                                         |                                    |
| • Resistance-type thermometer, relative to input area                                                     |                                      |                                      | +/- 0.125 %                             |                                    |
| Interference voltage suppression for $f = n \times f_l$ ( $f_l \pm 1\%$ ), $f_l$ = interference frequency |                                      |                                      |                                         |                                    |
| • Series mode interference (peak value of interference < rated value of input range), min.                | 50 dB                                | 50 dB                                | 50 dB                                   | 42 dB                              |
| • common mode voltage (USS < 2.5 V), min.                                                                 | 70 dB; Interference voltage < 5 V    | 70 dB; Interference voltage < 5 V    | 70 dB; Interference voltage < 5 V       | 85 dB; Interference voltage < 10 V |
| <b>Parameter</b>                                                                                          |                                      |                                      |                                         |                                    |
| Diagnostics: wire break                                                                                   |                                      |                                      | 1                                       |                                    |
| Load voltage                                                                                              |                                      |                                      | No                                      |                                    |

## SIMATIC ET 200 distributed I/O

## ET 200pro

## I/O modules

## Analog expansion modules

## Technical specifications (continued)

|                                                | 6ES7 144-4FF00-0AB0                                          | 6ES7 144-4GF00-0AB0                                          | 6ES7 144-4JF00-0AB0                  | 6ES7 144-4PF00-0AB0                                                                                                                                                                                                                                                               |
|------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement type/range                         |                                                              |                                                              | R4L / R3L / R2L / TR4L / TR3L / TR2L | Deactivated/ +/- 80 mV/<br>TC-EL Type T (Cu-CuNi)/<br>TC-EL Type K (NiCr-Ni)/<br>TC-EL Type B (PtRh-PtRh)/<br>TC-EL Type N (NiCrSi-NiSi)/<br>TC-EL Typ E (NiCr-CuNi)/<br>TC-EL Type R (PtRh-Pt)/<br>TC-EL Type S (PtRh-Pt)/<br>TC-EL Type J (Fe-Cu-Ni)/<br>TC-EL Type L (Fe-CuNi) |
| Interference frequency suppression             |                                                              |                                                              | 50/60 Hz                             | 10/50/60/400 Hz                                                                                                                                                                                                                                                                   |
| Group diagnostics                              |                                                              |                                                              | 1                                    | Yes                                                                                                                                                                                                                                                                               |
| Overflow/underflow                             |                                                              |                                                              | 1                                    | Yes                                                                                                                                                                                                                                                                               |
| Comparison point                               |                                                              |                                                              |                                      | None/internal/RTD(0)/dyn. ref. temp./fix. ref. temp.                                                                                                                                                                                                                              |
| Unit                                           |                                                              |                                                              | Degrees C / Degrees F                | °C/°F/K                                                                                                                                                                                                                                                                           |
| <b>Alarms/diagnostics/status information</b>   |                                                              |                                                              |                                      |                                                                                                                                                                                                                                                                                   |
| <b>Alarms</b>                                  |                                                              |                                                              |                                      |                                                                                                                                                                                                                                                                                   |
| • Diagnostic alarm                             | Yes; parameterizable                                         | Yes; parameterizable                                         | Yes; parameterizable                 | Yes; parameterizable                                                                                                                                                                                                                                                              |
| • Limit value alarm                            |                                                              | Yes                                                          |                                      |                                                                                                                                                                                                                                                                                   |
| • Process alarm                                | Yes; (limit value alarm), can be parameterized for channel 0 | Yes; (limit value alarm), can be parameterized for channel 0 | No                                   | No                                                                                                                                                                                                                                                                                |
| <b>Diagnostics</b>                             |                                                              |                                                              |                                      |                                                                                                                                                                                                                                                                                   |
| • Diagnostics                                  |                                                              | Yes                                                          |                                      |                                                                                                                                                                                                                                                                                   |
| • Wire break                                   | Yes; at 1 to 5 V                                             | Yes; at 4 to 20 mA                                           | Yes                                  | No                                                                                                                                                                                                                                                                                |
| • Short circuit                                | Yes; at 1 to 5 V                                             | Yes; at 4 to 20 mA                                           |                                      |                                                                                                                                                                                                                                                                                   |
| • Group error                                  |                                                              | Yes                                                          | Yes                                  |                                                                                                                                                                                                                                                                                   |
| • Overflow/underflow                           |                                                              |                                                              | Yes                                  | Yes                                                                                                                                                                                                                                                                               |
| <b>Diagnostic indication LED</b>               |                                                              |                                                              |                                      |                                                                                                                                                                                                                                                                                   |
| • Group error SF (red)                         | Yes                                                          | Yes                                                          | Yes                                  | Yes                                                                                                                                                                                                                                                                               |
| <b>Isolation</b>                               |                                                              |                                                              |                                      |                                                                                                                                                                                                                                                                                   |
| Isolation checked with                         | 500 V DC                                                     | 500 V DC                                                     | 500 V DC                             | 500 V DC                                                                                                                                                                                                                                                                          |
| <b>Galvanic isolation</b>                      |                                                              |                                                              |                                      |                                                                                                                                                                                                                                                                                   |
| Galvanic isolation analog inputs               |                                                              |                                                              |                                      |                                                                                                                                                                                                                                                                                   |
| • between the channels                         | No                                                           | No                                                           | No                                   | No                                                                                                                                                                                                                                                                                |
| • between the channels and the backplane bus   | Yes                                                          | Yes                                                          | Yes                                  | Yes                                                                                                                                                                                                                                                                               |
| • between the channels and the load voltage L+ |                                                              |                                                              |                                      | Yes                                                                                                                                                                                                                                                                               |
| <b>Permissible potential difference</b>        |                                                              |                                                              |                                      |                                                                                                                                                                                                                                                                                   |
| between the inputs (UCM)                       |                                                              |                                                              | 5 Vpp AC                             | 20 Vpp AC                                                                                                                                                                                                                                                                         |
| between inputs and MANA (UCM)                  | 5 Vpp AC                                                     | 5 Vpp AC                                                     |                                      |                                                                                                                                                                                                                                                                                   |
| between MANA and M internally (UIISO)          | 500 V DC                                                     | 500 V DC                                                     | 500 V DC                             |                                                                                                                                                                                                                                                                                   |
| <b>Dimensions and weight</b>                   |                                                              |                                                              |                                      |                                                                                                                                                                                                                                                                                   |
| Dimensions                                     |                                                              |                                                              |                                      |                                                                                                                                                                                                                                                                                   |
| • Width                                        | 45 mm                                                        | 45 mm                                                        | 45 mm                                | 45 mm                                                                                                                                                                                                                                                                             |
| • Height                                       | 130 mm                                                       | 130 mm                                                       | 130 mm                               | 130 mm                                                                                                                                                                                                                                                                            |
| • Depth                                        | 35 mm                                                        | 35 mm                                                        | 35 mm                                | 35 mm                                                                                                                                                                                                                                                                             |
| Weight                                         |                                                              |                                                              |                                      |                                                                                                                                                                                                                                                                                   |
| • Weight, approx.                              | 150 g                                                        | 150 g                                                        | 150 g                                | 150 g                                                                                                                                                                                                                                                                             |

## Technical specifications (continued)

|                                                                     | 6ES7 145-4FF00-0AB0                                              | 6ES7 145-4GF00-0AB0                                              |
|---------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|
| <b>Supply voltages</b>                                              |                                                                  |                                                                  |
| Load voltage L+                                                     | 24 V                                                             | 24 V                                                             |
| • Rated value (DC)                                                  | Yes; against destruction                                         | Yes; against destruction                                         |
| • Reverse polarity protection                                       |                                                                  |                                                                  |
| <b>Current consumption</b>                                          |                                                                  |                                                                  |
| from backplane bus 3.3 V DC, max.                                   | 10 mA                                                            | 10 mA                                                            |
| <b>Address area</b>                                                 |                                                                  |                                                                  |
| Address space per module                                            | 8 byte                                                           | 8 byte                                                           |
| • Address space per module, max.                                    |                                                                  |                                                                  |
| <b>Analog outputs</b>                                               |                                                                  |                                                                  |
| Number of analog outputs                                            | 4                                                                | 4                                                                |
| Cable length, shielded, max.                                        | 30 m                                                             | 30 m                                                             |
| Voltage output, short-circuit protection                            | Yes; per channel, electronic to chassis                          | Yes; per module, electronic to chassis                           |
| Voltage output, short-circuit current, max..                        | 50 mA                                                            |                                                                  |
| Current output, no-load voltage, max.                               |                                                                  | 16 V                                                             |
| Cycle time (all channels) max.                                      | 3 ms                                                             | 3 ms                                                             |
| Output ranges, voltage                                              |                                                                  |                                                                  |
| • 0 to 10 V                                                         | Yes                                                              |                                                                  |
| • 1 to 5 V                                                          | Yes                                                              |                                                                  |
| • -10 to +10 V                                                      | Yes                                                              |                                                                  |
| Output ranges, current                                              |                                                                  |                                                                  |
| • 0 to 20 mA                                                        |                                                                  | Yes                                                              |
| • -20 to +20 mA                                                     |                                                                  | Yes                                                              |
| • 4 to 20 mA                                                        |                                                                  | Yes                                                              |
| Connection of actuators                                             |                                                                  |                                                                  |
| • for voltage output 2-conductor connection                         | Yes                                                              |                                                                  |
| • for voltage output 4-conductor connection                         | Yes                                                              |                                                                  |
| • for current output 2-conductor connection                         |                                                                  | Yes                                                              |
| • for current output 4-conductor connection                         |                                                                  | Yes                                                              |
| Load impedance (in rated range of output)                           |                                                                  |                                                                  |
| • with voltage outputs, min.                                        | 1 000 Ω                                                          |                                                                  |
| • with voltage outputs, capacitive load, max.                       | 1 μF                                                             |                                                                  |
| • with current outputs, max.                                        |                                                                  | 600 Ω                                                            |
| • with current outputs, inductive load, max.                        |                                                                  | 1 mH                                                             |
| Destruction limits against externally applied voltages and currents |                                                                  |                                                                  |
| • Voltages at the outputs towards MANA                              | 16 V; permanent                                                  |                                                                  |
| • Current, max.                                                     |                                                                  | 100 mA                                                           |
| <b>Analog value creation</b>                                        |                                                                  |                                                                  |
| Integrations and conversion time/ resolution per channel            |                                                                  |                                                                  |
| • Resolution with overrange (bit including sign), max.              | 15 bit; at -10 to +10 V; 14 bit at 1 to 5 V; 15 bit at 0 to 10 V | 15 bit; at +/- 20 mA; 14 bit at 0 to 20 mA; 15 bit at 4 to 20 mA |
| • Conversion time (per channel)                                     | 0.7 ms                                                           | 0.7 ms                                                           |
| Settling time                                                       |                                                                  |                                                                  |
| • for resistive load                                                | 0.1 ms                                                           | 0.1 ms                                                           |
| • for capacitive load                                               | 6 ms                                                             |                                                                  |
| • for inductive load                                                |                                                                  | 1 ms                                                             |

## SIMATIC ET 200 distributed I/O

## ET 200pro

## I/O modules

## Analog expansion modules

## Technical specifications (continued)

|                                                                      | 6ES7 145-4FF00-0AB0                 | 6ES7 145-4GF00-0AB0                 |
|----------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Errors/accuracies</b>                                             |                                     |                                     |
| Output ripple (based on output area, bandwidth 0 to 50 kHz)          | +/- 0.02 %                          | +/- 0.02 %                          |
| Linearity error (relative to output area)                            | +/- 0.1 %                           | +/- 0.1 %                           |
| Temperature error (relative to output area)                          | +/- 0.01 %                          | +/- 0.01 %                          |
| Repeat accuracy in settled status at 25 °C (relative to output area) | +/- 0.05 %                          | +/- 0.05 %                          |
| Operational limit in overall temperature range                       |                                     |                                     |
| • Voltage, relative to output area                                   | +/- 0.2 %                           |                                     |
| • Current, relative to output area                                   |                                     | +/- 0.2 %                           |
| Basic error limit (operational limit at 25 °C)                       |                                     |                                     |
| • Voltage, relative to output area                                   | +/- 0.15 %                          |                                     |
| • Current, relative to output area                                   |                                     | +/- 0.15 %                          |
| <b>Parameter</b>                                                     |                                     |                                     |
| Output type/range                                                    | 1                                   | 1                                   |
| Diagnosis: wire break                                                |                                     | 1                                   |
| Diagnosis: short circuit                                             | Outputs; sensor supply to M         | Encoder supply to M                 |
| Group diagnostics                                                    | 1                                   | 1                                   |
| Behavior on CPU/Master STOP                                          | 1                                   | 1                                   |
| <b>Alarms/diagnostics/status information</b>                         |                                     |                                     |
| Substitute values connectable                                        | Yes                                 | Yes                                 |
| Alarms                                                               |                                     |                                     |
| • Diagnostic alarm                                                   | Yes; parameterizable                | Yes; parameterizable                |
| • Process alarm                                                      | No                                  | No                                  |
| Diagnostics                                                          |                                     |                                     |
| • Diagnostic functions                                               |                                     | Yes                                 |
| • Diagnostic information readable                                    | Yes                                 |                                     |
| • Wire break                                                         | No                                  | Yes; per channel, not in zero range |
| • Short circuit                                                      | Yes; per channel, not in zero range |                                     |
| • Short circuit encoder supply                                       | Yes; per module                     | Yes; per module                     |
| Diagnostic indication LED                                            |                                     |                                     |
| • Group error SF (red)                                               | Yes                                 | Yes                                 |
| <b>Galvanic isolation</b>                                            |                                     |                                     |
| Galvanic isolation analog outputs                                    |                                     |                                     |
| • between the channels                                               | No                                  | No                                  |
| • between the channels and the backplane bus                         | Yes                                 | Yes                                 |
| <b>Dimensions and weight</b>                                         |                                     |                                     |
| Dimensions                                                           |                                     |                                     |
| • Width                                                              | 45 mm                               | 45 mm                               |
| • Height                                                             | 130 mm                              | 130 mm                              |
| • Depth                                                              | 35 mm                               | 35 mm                               |
| Weight                                                               |                                     |                                     |
| • Weight, approx.                                                    | 150 g                               | 150 g                               |

| Ordering data                                                                                                                                                                                                                                                           | Order No.                  | Order No.                                                                                                                                                                           |                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>4AI U analog input module</b><br>High Feature, ±10 V; ±5 V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately                                                                                    | <b>6ES7 144-4FF00-0AB0</b> | <b>4AO I analog output module</b><br>High Feature, ±20 mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately | <b>6ES7 145-4GF00-0AB0</b> |
| <b>4AI I analog input module</b><br>High Feature, ±20 mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately                                                                                      | <b>6ES7 144-4GF00-0AB0</b> | <b>Accessories</b>                                                                                                                                                                  |                            |
| <b>4AI RTD analog input module</b><br>High Feature; resistances: 150, 300, 600 and 3000 Ohm; resistance thermometer: Pt100, 200, 500, 1000, Ni100, 120, 200, 500 and 1000; channel-discrete diagnostics, incl. bus module. Connection module must be ordered separately | <b>6ES7 144-4JF00-0AB0</b> | <b>CM IO 4 x M12 connection module</b><br>4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro                                                          | <b>6ES7 194-4CA00-0AA0</b> |
| <b>Analog input module 4AI TC</b><br>High Feature; thermocouples: Type B, E, J, K, L, N, R, S, T; voltage measurement: ±80 mV; channel diagnostics, including bus module. Connection module must be ordered separately                                                  | <b>6ES7 144-4PF00-0AB0</b> | <b>M12 compensation connectors</b><br>with integral PT100 for reference point compensation when connecting thermocouples                                                            | <b>6ES7 194-4AB00-0AA0</b> |
| <b>4AO U analog output module</b><br>High Feature, ±10 V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately                                                                                         | <b>6ES7 145-4FF00-0AB0</b> | <b>Module identification labels</b><br>For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each                                         | <b>6ES7 194-4HA00-0AA0</b> |
|                                                                                                                                                                                                                                                                         |                            | <b>M12 sealing cap</b><br>For protection of unused M12 connections with ET 200pro                                                                                                   | <b>3RX9 802-0AA00</b>      |

I: Subject to export regulations AL: N and ECCN: EAR99H



## SIMATIC ET 200 distributed I/O

## ET 200pro

## I/O modules

## Fail-safe digital expansion modules

## Overview



Fail-safe digital inputs/outputs with degree of protection IP65/66/67 for application on the machine level without control cabinet

## Fail-safe digital inputs

- For fail-safe reading of sensor information (1 or 2 channels)
- Provide integral discrepancy evaluation for 2-out-of-2 signals
- Internal sensor supplies (incl. test function) available

## Fail-safe digital outputs

- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be driven by up to 2 A

All modules are certified up to Cat. 4 (EN954-1) and up to SIL 3 (IEC 61508) and feature detailed diagnostics.

The modules support PROFI-safe, both in PROFIBUS, and in PROFINET configurations. They can be used with IM 151-7 F CPU, CPU31xF-2 DP, CPU31xF-2 PN/DP and CPU416F-2.

## Technical specifications

|                                       | 6ES7 148-4FA00-0AB0 | 6ES7 148-4FC00-0AB0 |
|---------------------------------------|---------------------|---------------------|
| <b>Supply voltages</b>                |                     |                     |
| Rated value                           |                     |                     |
| • permissible range, lower limit (DC) | 20.4 V              | 20.4 V              |
| • permissible range, upper limit (DC) | 28.8 V              | 28.8 V              |
| <b>Digital inputs</b>                 |                     |                     |
| Number of digital inputs              | 16                  | 8                   |
| <b>Dimensions and weight</b>          |                     |                     |
| Dimensions                            |                     |                     |
| • Width                               | 90 mm               | 90 mm               |
| • Height                              | 130 mm              | 130 mm              |
| • Depth                               | 65 mm               | 65 mm               |

## Ordering data

| Order No.                                                                                                                                                                                                                                    | Order No.                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Fail-safe digital input module 8/16 F-DI PROFI-safe</b><br>24 V DC, including bus module<br>Connection module must be ordered separately                                                                                                  | <b>6ES7 148-4FA00-0AB0</b> |
| <b>Fail-safe digital input/output module 4/8 F-DI, 4 F-DO 2 A</b><br>24 V DC, including bus module<br>Connection module must be ordered separately                                                                                           | <b>6ES7 148-4FC00-0AB0</b> |
| <b>Fail-safe electronic module F-Switch PROFI-safe</b><br>Three fail-safe PP-switching outputs for safe switching of the rear panel busbar (2L+, F0, F1); two fail-safe digital inputs, 45 mm; usable up to cat. 4 (EN 954)/SIL3 (IEC 61508) | <b>6ES7 148-4FS00-0AB0</b> |
| <b>Accessories</b>                                                                                                                                                                                                                           |                            |
| <b>Connection module</b><br>For the fail-safe electronic module F-switch PROFI-safe                                                                                                                                                          | <b>6ES7 194-4DA00-0AA0</b> |
| <b>Connection module</b><br>For the fail-safe electronic module 4/8 F-DI/4 F-DO, 24 V DC/2 A                                                                                                                                                 | <b>6ES7 194-4DC00-0AA0</b> |
| <b>Connection module</b><br>For the fail-safe electronic module 8/16 F-DI, 24 V DC/2 A                                                                                                                                                       | <b>6ES7 194-4DD00-0AA0</b> |
| <b>PROFIBUS DP interface module IM154-2</b><br>Including termination module                                                                                                                                                                  | <b>6ES7 154-2AA01-0AB0</b> |
| <b>PROFINET interface module IM154-4 PN</b><br>Including termination module                                                                                                                                                                  | <b>6ES7 154-4AB10-0AB0</b> |
| <b>M12 sealing cap</b><br>For protection of unused M12 connections with ET 200pro                                                                                                                                                            | <b>3RX9 802-0AA00</b>      |

I: Subject to export regulations AL: N and ECCN: EAR99H

## Overview



- PM-E 24 V DC power module

## Technical specifications

| 6ES7 148-4CA00-0AA0                          |                                                              |
|----------------------------------------------|--------------------------------------------------------------|
| <b>Power supply</b>                          |                                                              |
| Input voltage                                |                                                              |
| • Rated value, 24 V DC                       | Yes                                                          |
| Current carrying capacity                    |                                                              |
| • Current carrying capacity, max.            | 10 A; up to 55 °C (on the internal busbars of the ET 200pro) |
| <b>Supply voltages</b>                       |                                                              |
| Load voltage 2L+                             |                                                              |
| • Short-circuit protection                   | Yes; via an exchangeable fuse in the power module            |
| • Reverse polarity protection                | Yes; against destruction                                     |
| <b>Parameter</b>                             |                                                              |
| Missing load voltage                         | Potential group of the power module                          |
| <b>Alarms/diagnostics/status information</b> |                                                              |
| Diagnostics                                  |                                                              |
| • Diagnostic functions                       | Yes                                                          |
| • Diagnostic information readable            | Yes                                                          |
| • Missing load voltage                       | Yes                                                          |
| Diagnostic indication LED                    |                                                              |
| • Group error SF (red)                       | Yes                                                          |
| • Load voltage monitoring DC 24 V (green)    | Yes                                                          |
| <b>Isolation</b>                             |                                                              |
| Isolation checked with                       | 500 V DC                                                     |
| <b>Degree of protection</b>                  |                                                              |
| IP65                                         | Yes                                                          |
| IP66                                         | Yes                                                          |
| IP67                                         | Yes                                                          |
| <b>Dimensions and weight</b>                 |                                                              |
| Dimensions                                   |                                                              |
| • Width                                      | 15 mm                                                        |
| • Height                                     | 81 mm                                                        |
| • Depth                                      | 52 mm                                                        |
| Weight                                       |                                                              |
| • Weight, approx.                            | 35 g                                                         |

## SIMATIC ET 200 distributed I/O

## ET 200pro

## I/O modules

## PM-E power module

## Ordering data

## Order No.

## Order No.

**PM-E 24 V DC power module**

For backfeed and group formation of the 24 V DC load supply for electronic modules within an ET 200pro station.

**6ES7 148-4CA00-0AA0****Accessories****CM PM-E ECOFAST connecting module**

For backfeed of 24 V load voltage, 1 ECOFAST Cu connection

**6ES7 194-4BA00-0AA0****CM PM-E direct connecting module**

For backfeed of 24 V load voltage, up to 2 M20 screwed cable glands

**6ES7 194-4BC00-0AA0****CM PM-E 7/8" connecting module**

For backfeed of 24 V load voltage, 1 x 7/8"

**6ES7 194-4BD00-0AA0****CM PM-E PP connection module**

For supplying 24-V load voltage, 2 x push-pull, with spare fuse

**6ES7 194-4BE00-0AA0****Spare fuse**

12.5 A quick-response, for interface and power modules, 10 items per package item

**6ES7 194-4HB00-0AA0****PROFIBUS ECOFAST hybrid cable, copper**

Trailing-type cable (PUR casing) with two shielded copper cables for PROFIBUS DP and four copper cores of 1.5 mm<sup>2</sup> in cross-section

Unassembled

- 50 m
- 100 m

Preassembled  
with ECOFAST male and female connector, fixed length

- 1.5 m
- 3 m
- 5 m
- 10 m
- 15 m
- 20 m
- 25 m
- 30 m
- 35 m
- 40 m
- 45 m
- 50 m

**6XV1 830-7AN50**  
**6XV1 830-7AT10**
**6XV1 830-7BH15**  
**6XV1 830-7BH30**  
**6XV1 830-7BH50**  
**6XV1 830-7BN10**  
**6XV1 830-7BN15**  
**6XV1 830-7BN20**  
**6XV1 830-7BN25**  
**6XV1 830-7BN30**  
**6XV1 830-7BN35**  
**6XV1 830-7BN40**  
**6XV1 830-7BN45**  
**6XV1 830-7BN50**
**PROFIBUS ECOFAST hybrid cable, GP**

Trailing-type cable with 4 x copper cores and 2 x copper cores, shielded, with UL approval

Unassembled

- 50 m
- 100 m

Preassembled  
with ECOFAST male and female connector

- 1.5 m
- 3 m
- 5 m
- 10 m
- 15 m
- 20 m
- 25 m
- 30 m
- 35 m
- 40 m
- 45 m
- 50 m

**6XV1 860-4PN50**  
**6XV1 860-4PT10**
**6XV1 860-3PH15**  
**6XV1 860-3PH30**  
**6XV1 860-3PH50**  
**6XV1 860-3PN10**  
**6XV1 860-3PN15**  
**6XV1 860-3PN20**  
**6XV1 860-3PN25**  
**6XV1 860-3PN30**  
**6XV1 860-3PN35**  
**6XV1 860-3PN40**  
**6XV1 860-3PN45**  
**6XV1 860-3PN50**
**ECOFAST cable connector, for user assembly**

Female connector; ordering unit 5 units

**6GK1 905-0CB00****PROFIBUS ECOFAST hybrid plug, angled**

With 2 x shielded copper cores and 4 x 1.5 mm<sup>2</sup> copper cores; 5 units; with assembly instructions; female insert

**6GK1 905-0CD00****Push-Pull cable connector**

For 1L+/2L+, unassembled

**6GK1 907-0AB10-6AA0****Cover caps for Push-Pull female connectors**

5 units

**6ES7 194-4JA50-0AA0****Accessories for CM PM-E direct****Power line**

5-core, 5 x 1.5 mm<sup>2</sup>, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m

**6XV1 830-8AH10****Accessories for CM PM-E 7/8"****7/8" connecting cable to power supply**

5-core, 5 x 1.5 mm<sup>2</sup>, trailing type, pre-assembled with two 7/8" connectors, 5-pin

- 1.5 m long
- 2.0 m long
- 3.0 m long
- 5.0 m long
- 10 m long
- 15 m long

**6XV1 822-5BH15**  
**6XV1 822-5BH20**  
**6XV1 822-5BH30**  
**6XV1 822-5BH50**  
**6XV1 822-5BN10**  
**6XV1 822-5BN15**
**7/8" cable connector**

With axial cable outlet  
• with female insert, 5 per pack

**6GK1 905-0FB00**

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## Overview



- PM-O 2x 24 V DC power module

## Technical specifications

|                                              | 6ES7 148-4CA60-0AA0                                                           |
|----------------------------------------------|-------------------------------------------------------------------------------|
| <b>Power supply</b>                          |                                                                               |
| Current carrying capacity                    |                                                                               |
| • Current carrying capacity, max.            | Output current 2 A for 1L+ and 6 A for 2L+                                    |
| <b>Supply voltages</b>                       |                                                                               |
| Supply voltage from power module             |                                                                               |
| • Rated value (DC)                           | 24 V                                                                          |
| Load voltage 2L+                             |                                                                               |
| • Short-circuit protection                   | Yes                                                                           |
| • Reverse polarity protection                | Yes; against destruction                                                      |
| <b>Parameter</b>                             |                                                                               |
| Remark                                       | Diagnosis short circuit implemented after M for 1L+                           |
| <b>Alarms/diagnostics/status information</b> |                                                                               |
| Diagnostics                                  |                                                                               |
| • Diagnostic functions                       | Yes                                                                           |
| • Diagnostic information readable            | Yes                                                                           |
| • Fuse blown                                 | No; Indirect diagnosis (short circuit after M for 1L+), since electronic fuse |
| • Missing load voltage                       | No                                                                            |

|                                           | 6ES7 148-4CA60-0AA0          |
|-------------------------------------------|------------------------------|
| <b>Diagnostic indication LED</b>          |                              |
| • Rated load voltage PWR (green)          | No                           |
| • Group error SF (red)                    | Yes                          |
| • Load voltage monitoring 24 V DC (green) | No; signalled in IM or in PM |
| <b>Isolation</b>                          |                              |
| Isolation checked with                    | 500 V DC                     |
| <b>Galvanic isolation</b>                 |                              |
| primary/secondary                         | No                           |
| <b>Degree of protection</b>               |                              |
| IP65                                      | Yes                          |
| IP66                                      | Yes                          |
| IP67                                      | Yes                          |
| <b>Dimensions and weight</b>              |                              |
| Dimensions                                |                              |
| • Width                                   | 45 mm                        |
| • Height                                  | 130 mm                       |
| • Depth                                   | 35 mm                        |
| Weight                                    |                              |
| • Weight, approx.                         | 150 g                        |

## Ordering data

|                                                                                                              | Order No.                  |
|--------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>PM-O 2 x 24 V DC power module</b>                                                                         | <b>6ES7 148-4CA60-0AA0</b> |
| For drawing the 24 V load voltage 2L+ and electronic/encoder supply voltage 1L+ within an ET 200pro station. |                            |

## Order No.

|                                                                                                  | Order No.                  |
|--------------------------------------------------------------------------------------------------|----------------------------|
| <b>Accessories</b>                                                                               |                            |
| <b>CM PM-O PP connection module</b>                                                              | <b>6ES7 194-4BH00-0AA0</b> |
| For drawing the 24 V load voltage and electronic/encoder supply voltage, 2 x push-pull connector |                            |
| <b>Push-Pull cable connector</b>                                                                 | <b>6GK1 907-0AB10-6AA0</b> |
| For 1L+/ 2L+, unassembled                                                                        |                            |
| <b>Cover caps for Push-Pull female connectors</b>                                                | <b>6ES7 194-4JA50-0AA0</b> |
| 5 units                                                                                          |                            |

I: Subject to export regulations AL: N and ECCN: EAR99H

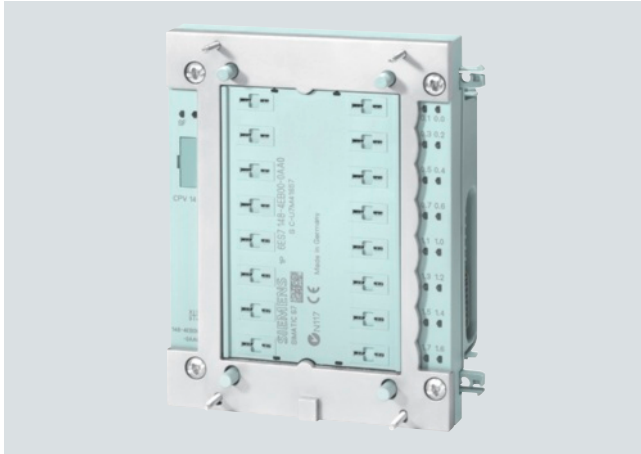
# SIMATIC ET 200 distributed I/O

## ET 200pro

### I/O modules

### ET 200pro pneumatic interface

#### Overview



- Interface for holding an original FESTO CPV 10 or CPV 14 compact performance valve terminal
- For using the ET 200pro in applications with flexible pneumatics
- Highly flexible pneumatics due to a variety of valve functions and choice of flow rates

#### Technical specifications

|                                              | 6ES7 148-4EA00-0AA0                         | 6ES7 148-4EB00-0AA0                         |
|----------------------------------------------|---------------------------------------------|---------------------------------------------|
| <b>Supply voltages</b>                       |                                             |                                             |
| Load voltage 2L+                             |                                             |                                             |
| • Rated value (DC)                           | 24 V                                        | 24 V                                        |
| • Short-circuit protection                   | Yes                                         | Yes                                         |
| • Reverse polarity protection                | Yes                                         | Yes                                         |
| <b>Current consumption</b>                   |                                             |                                             |
| from load voltage 2L+ (without load), max.   | 20 mA                                       | 20 mA                                       |
| from backplane bus 3.3 V DC, max.            | 25 mA                                       | 25 mA                                       |
| <b>Power losses</b>                          |                                             |                                             |
| Power loss, typ.                             | 2.6 W                                       | 3.7 W                                       |
| <b>Address area</b>                          |                                             |                                             |
| Address space per module                     |                                             |                                             |
| • without packing                            | 2 byte                                      | 2 byte                                      |
| <b>Digital outputs</b>                       |                                             |                                             |
| Number of digital outputs                    | 16                                          | 16                                          |
| Output current                               |                                             |                                             |
| • for signal "1" rated value                 | 12 mA                                       | 16 mA                                       |
| Switching frequency                          |                                             |                                             |
| • with inductive load, max.                  | 25 Hz                                       | 20 Hz                                       |
| Aggregate current of outputs (per group)     |                                             |                                             |
| • up to 55 °C, max.                          | 250 mA; only up to 50 °C, limited by valves | 330 mA; only up to 50 °C, limited by valves |
| Load resistance range                        |                                             |                                             |
| • lower limit                                | 500 Ω                                       | 500 Ω                                       |
| • upper limit                                | 2 500 Ω                                     | 2 500 Ω                                     |
| <b>Parameter</b>                             |                                             |                                             |
| Remark                                       | Diagnostic load voltage 2L+                 | Diagnostic load voltage 2L+                 |
| Behavior on CPU/Master STOP                  | no                                          |                                             |
| <b>Alarms/diagnostics/status information</b> |                                             |                                             |
| Alarms                                       |                                             |                                             |
| • Diagnostic alarm                           | Yes                                         | Yes                                         |
| Diagnostics                                  |                                             |                                             |
| • Diagnostic functions                       | Yes                                         | Yes                                         |
| • Diagnostic information readable            | Yes                                         | Yes                                         |
| Diagnostic indication LED                    |                                             |                                             |
| • Group error SF (red)                       | Yes                                         | Yes                                         |
| • Status indicator digital output (green)    | Yes                                         | Yes                                         |

**Technical specifications** (continued)

|                                                        | 6ES7 148-4EA00-0AA0 | 6ES7 148-4EB00-0AA0 |
|--------------------------------------------------------|---------------------|---------------------|
| <b>Isolation</b>                                       |                     |                     |
| Isolation checked with                                 | 500 V DC            | 500 V DC            |
| tested with                                            |                     |                     |
| • Load voltage L+ against backplane bus                | 500 V DC            | 500 V DC            |
| <b>Galvanic isolation</b>                              |                     |                     |
| between backplane bus and all other circuit components | Yes                 | Yes                 |
| between the channels and backplane bus                 | Yes                 | Yes                 |
| Galvanic isolation digital outputs                     |                     |                     |
| • between the channels and the backplane bus           | Yes                 | Yes                 |
| <b>Permissible potential difference</b>                |                     |                     |
| between different circuits                             | 75 V DC / 60 V AC   | 75 V DC / 60 V AC   |
| <b>Dimensions and weight</b>                           |                     |                     |
| Dimensions                                             |                     |                     |
| • Width                                                | 90 mm               | 120 mm              |
| • Height                                               | 130 mm              | 152 mm              |
| • Depth                                                | 47 mm               | 47 mm               |

**Ordering data****Order No.****Order No.****EM 148-P pneumatic interface**

DO 16 x P/CPV 10 for direct accommodation of FESTO valve terminal CPV 10 16 DO x P

**6ES7 148-4EA00-0AA0**

DO 16 x P/CPV 14 for direct accommodation of FESTO valve terminal CPV 14 16 DO x P

**6ES7 148-4EB00-0AA0**

FESTO CPV10 valve terminal

To be purchased by FESTO

FESTO CPV 14 valve terminal

To be purchased by FESTO

FESTO AG & Co  
Ruiterstr. 82  
D-73732 Esslingen

More addresses  
in the Internet at:  
[www.festo.de](http://www.festo.de)

I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200pro

### I/O modules SIMATIC RF170C

#### Overview



The SIMATIC RF170C is a communication module for connecting the SIMATIC identification systems to the ET 200pro distributed I/O system. The readers (SLGs) of all RFID systems as well as the MV400 code-reading systems can be operated on the SIMATIC RF170C.

Thanks to its high degree of protection and ruggedness, ET 200pro is particularly suitable for machine-level use. The modular structure with PROFIBUS and PROFINET connection systems allows them to be used in all applications. The uniform plug-in connection system ensures rapid commissioning.

#### Technical specifications

| Communication module                                                              | SIMATIC RF170C                        |
|-----------------------------------------------------------------------------------|---------------------------------------|
| Ambient temperature                                                               | -25 ... 55 °C                         |
| • During operation                                                                | -40 ... +70 °C 20 K/h                 |
| • During storage                                                                  |                                       |
| Relative humidity                                                                 | 5 ... max. 100%                       |
| Atmospheric pressure                                                              | 795 ... 1 080 hPa                     |
| Resistance to shock                                                               | as for ET 200pro                      |
| Vibration                                                                         | as for ET 200pro                      |
| Supply voltage                                                                    |                                       |
| • Rated value                                                                     | 24 V DC                               |
| • Permissible range                                                               | 20.4 ... 28.8 V DC                    |
| Current consumption                                                               |                                       |
| • Without reader                                                                  | typ. 130 mA                           |
| • With 2 readers                                                                  | Max. 1 000 mA                         |
| Enclosure                                                                         |                                       |
| • Degree of protection                                                            | IP67                                  |
| • Enclosure material                                                              | Thermoplastic (fiberglass reinforced) |
| • Housing color                                                                   | IP Basic 714                          |
| Dimensions W x H x D (mm)                                                         |                                       |
| • SIMATIC RF170C without connection block                                         | 90 x 130 x 35                         |
| • SIMATIC RF170C with connection block                                            | 90 x 130 x 60                         |
| Weight                                                                            |                                       |
| • Without connection block                                                        | Approx. 270 g                         |
| • With connection block                                                           | Approx. 770 g                         |
| Serial reader interface (gross transmission rate) MOBY U/D, RF200 / RF300 / RF600 | 19 200, 57 600, 115 200 bit/s         |
| Connectors                                                                        | 2 x connector plug M12, 8-pin         |
| Cable length to reader                                                            |                                       |
| • Standard length                                                                 | 2 m                                   |
| • Optional preassembled cables                                                    | 5 m, 10 m, 20 m, 50 m                 |
| • Self-assembled cables                                                           | Reader-dependent, up to 1 000 m       |
| Supply voltage to reader                                                          | 24 V                                  |
| Max. current; 2 readers connected                                                 | 0.4 A per reader                      |
| Max. current; 1 readers connected                                                 | 0.8 A per reader                      |

## SIMATIC ET 200 distributed I/O

ET 200pro

I/O modules  
SIMATIC RF170C

| Ordering data                                                                                                                                                                                                                                                 | Order No.                                                                                                                 |                                                                                                                                                                  | Order No.             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>SIMATIC RF170C communication module</b><br>For connecting to the distributed I/O system ET 200pro                                                                                                                                                          | <b>6GT2 002-0HD00</b>                                                                                                     | <b>M12 Reader cable<br/>SIMATIC RF200 / RF300</b><br>pre-assembled, between ASM 456, RF170C, RF180C, RF182C and reader, material PUR, plug angled at reader, 2 m | <b>6GT2 891-4JH20</b> |
| <b>Accessories</b>                                                                                                                                                                                                                                            |                                                                                                                           |                                                                                                                                                                  |                       |
| <b>Connection block for SIMATIC RF170C</b><br>For connecting 2 readers via an M12 connector                                                                                                                                                                   | <b>6GT2 002-1HD00</b>                                                                                                     | <b>M12 sealing caps for unused reader connections</b><br>10 units minimum order quantity, price per 100 units                                                    | <b>3RX9 802-0AA00</b> |
| <b>Reader cable for MOBY U</b><br>PUR material, CMG approved, suitable for cable carriers<br><br>2 m<br>5 m                                                                                                                                                   | <b>6GT2 091-4FH20</b><br><b>6GT2 091-4FH50</b>                                                                            | <b>DVD "RFID Systems Software &amp; Documentation"</b>                                                                                                           | <b>6GT2 080-2AA20</b> |
| <b>Reader cable for MOBY D</b><br>PUR material, CMG approved, suitable for cable carriers, 2 m                                                                                                                                                                | <b>6GT2 691-4FH20</b>                                                                                                     |                                                                                                                                                                  |                       |
| <b>Reader cable for SIMATIC RF200 / RF300 / RF600 / MV400</b><br>Or extension cable MOBY U/D and SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, CMG approved, suitable for cable carriers, straight connector<br><br>2 m<br>5 m<br>10 m<br>20 m<br>50 m | <b>6GT2 891-4FH20</b><br><b>6GT2 891-4FH50</b><br><b>6GT2 891-4FN10</b><br><b>6GT2 891-4FN20</b><br><b>6GT2 891-4FN50</b> |                                                                                                                                                                  |                       |

I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S



# SIMATIC ET 200 distributed I/O

## ET 200pro

### SIMATIC ET200pro PS

#### Overview



SIMATIC ET200pro PS, the power supply unit with degree of protection IP67, is used as electronic/encoder and load voltage supply for the new I/O device. With signaling contact for "24 V OK" and "Overtemperature" as well as a second connector for looping through the input voltage.

#### Technical specifications

|                                                             |                                                                                 |
|-------------------------------------------------------------|---------------------------------------------------------------------------------|
| <b>Order No.</b>                                            | <b>6ES7 148-4PC00-0HA0</b>                                                      |
| <b>Product</b>                                              | <b>SIMATIC ET200pro PS</b>                                                      |
| <b>Power supply, type</b>                                   | <b>24 V/8 A</b>                                                                 |
| <b>Input</b>                                                |                                                                                 |
| Input                                                       | 3-phase AC                                                                      |
| Voltage range                                               | 340 ... 550 V                                                                   |
| Note                                                        | 320 ... 340 V for max. 1 min                                                    |
| Wide-range input                                            | Yes                                                                             |
| Overvoltage resistance                                      | Implemented internally with varistors                                           |
| Mains buffering at lout rated, min.                         | 15 ms                                                                           |
| Mains buffering                                             | at $V_{in} = 400\text{ V}$                                                      |
| Rated line frequency                                        |                                                                                 |
| • 1                                                         | 50 Hz                                                                           |
| • 2                                                         | 60 Hz                                                                           |
| Rated line range                                            | 45 ... 66 Hz                                                                    |
| Input current                                               |                                                                                 |
| • at nominal level of the input voltage 400 V nominal value | 0.5 A                                                                           |
| Switch-on current limiting (+25 °C), max.                   | 40 A                                                                            |
| Duration of current limiting at 25 °C                       |                                                                                 |
| • typical                                                   |                                                                                 |
| • maximum                                                   |                                                                                 |
| Inrush current A <sup>2</sup> s                             | 3.5 A <sup>2</sup> s                                                            |
| Built-in incoming fuse                                      | internal, 4 A                                                                   |
| Protection in the mains power input (IEC 898)               | Required: Circuit breaker 2.2 ... 3.2 A 3RV1021-1DA10 or 3RV1721-1DD10 (UL 489) |
| <b>Output</b>                                               |                                                                                 |
| Output                                                      | controlled, isolated DC voltage                                                 |
| Rated voltage                                               | 24 V                                                                            |
| Total tolerance, static ±                                   | 3 %                                                                             |
| Static mains compensation, approx.                          | 0.5 %                                                                           |
| Static load balancing, approx.                              | 0.5 %                                                                           |

|                                                                                                     |                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Order No.</b>                                                                                    | <b>6ES7 148-4PC00-0HA0</b>                                                                                                                                                                             |
| <b>Product</b>                                                                                      | <b>SIMATIC ET200pro PS</b>                                                                                                                                                                             |
| <b>Power supply, type</b>                                                                           | <b>24 V/8 A</b>                                                                                                                                                                                        |
| Residual ripple peak-peak, max.                                                                     | 200 mV                                                                                                                                                                                                 |
| Residual ripple peak-peak, typ.                                                                     |                                                                                                                                                                                                        |
| Spikes peak-peak, max. (bandwidth: 20 MHz)                                                          | 250 mV                                                                                                                                                                                                 |
| • max.                                                                                              |                                                                                                                                                                                                        |
| Product feature output voltage adjustable                                                           | No                                                                                                                                                                                                     |
| Output voltage setting                                                                              | -                                                                                                                                                                                                      |
| Status display                                                                                      | Green LED for 24 V OK                                                                                                                                                                                  |
| Signaling                                                                                           | max. 30 V, 10 mA; Power-Good (High-Pegel 1L+ for Vout in range 21.3 ... 29 V); Overtemperature warning at least 30 s before switch-off (high level 1L+ when the max. internal temperature is exceeded) |
| On/off behavior                                                                                     | Overshoot of Vout < 2 %                                                                                                                                                                                |
| Startup delay, max.                                                                                 | 1.5 s                                                                                                                                                                                                  |
| Voltage rise, typ.                                                                                  | 40 ms                                                                                                                                                                                                  |
| Rated current value lout rated                                                                      | 8 A                                                                                                                                                                                                    |
| Current range                                                                                       | 0 A                                                                                                                                                                                                    |
| Current range up to +55 °C                                                                          | 8 A                                                                                                                                                                                                    |
| delivered active power typ.                                                                         | 192 W                                                                                                                                                                                                  |
| short-term overload current at short-circuit during run-up typical                                  | 50 A                                                                                                                                                                                                   |
| Duration of overloading ability for excess current on short-circuiting during the start-up          | 100 ms                                                                                                                                                                                                 |
| Short-term overload current at short-circuit during operation typical                               | 50 A                                                                                                                                                                                                   |
| Duration of overloading ability for excess current on short-circuiting during the operational phase | 100 ms                                                                                                                                                                                                 |
| Parallel switching for enhanced performance                                                         | No                                                                                                                                                                                                     |

# SIMATIC ET 200 distributed I/O

## ET 200pro

SIMATIC ET200pro PS

### Technical specifications (continued)

|                                                              |                                                                               |
|--------------------------------------------------------------|-------------------------------------------------------------------------------|
| <b>Order No.</b>                                             | <b>6ES7 148-4PC00-0HA0</b>                                                    |
| <b>Product</b>                                               | <b>SIMATIC ET200pro PS</b>                                                    |
| <b>Power supply, type</b>                                    | <b>24 V/8 A</b>                                                               |
| <b>Efficiency</b>                                            |                                                                               |
| Efficiency at Vout rated, Iout rated, approx.                | 88 %                                                                          |
| Power loss at Vout rated, Iout rated, approx.                | 25 W                                                                          |
| <b>Closed-loop control</b>                                   |                                                                               |
| Dynamic mains compensation (Vin rated $\pm 15$ %), max.      | 0.5 %                                                                         |
| Dynamic load smoothing (Iout: 50/100/50 %), Uout $\pm$ typ.  | 1 %                                                                           |
| Setting time maximum                                         | 2 ms                                                                          |
| <b>Protection and monitoring</b>                             |                                                                               |
| Output overvoltage protection                                | < 33 V                                                                        |
| Current limitation, typ.                                     | 9.4 A                                                                         |
| Characteristic feature of the output short-circuit protected | Yes                                                                           |
| Short-circuit protection                                     | Electronic shutdown, automatic restart                                        |
| Enduring short circuit current Effective level               |                                                                               |
| • maximum                                                    | 10 A                                                                          |
| Overload/short-circuit indicator                             | -                                                                             |
| <b>Safety</b>                                                |                                                                               |
| Primary/secondary isolation                                  | Yes                                                                           |
| Potential separation                                         | Protective extra low output voltage Vout according to EN 60950-1 and EN 50178 |
| Protection class                                             | Class I                                                                       |
| stray current                                                |                                                                               |
| • maximum                                                    | 3.5 mA                                                                        |
| • typical                                                    | 0.4 mA                                                                        |
| CE mark                                                      | Yes                                                                           |
| UL/CSA approval                                              | No                                                                            |
| UL/cUL (CSA) approval                                        | in preparation                                                                |
| FM approval                                                  | No                                                                            |
| CB approval                                                  | Yes                                                                           |
| Marine approval                                              | -                                                                             |
| Degree of protection (EN 60529)                              | IP67, enclosure type 4 indoor                                                 |

|                                                                  |                                                                                                              |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Order No.</b>                                                 | <b>6ES7 148-4PC00-0HA0</b>                                                                                   |
| <b>Product</b>                                                   | <b>SIMATIC ET200pro PS</b>                                                                                   |
| <b>Power supply, type</b>                                        | <b>24 V/8 A</b>                                                                                              |
| <b>EMC</b>                                                       |                                                                                                              |
| Emitted interference                                             | EN 55022 Class A                                                                                             |
| Supply harmonics limitation                                      | -                                                                                                            |
| Noise immunity                                                   | EN 61000-6-2                                                                                                 |
| <b>Operating data</b>                                            |                                                                                                              |
| Ambient temperature                                              |                                                                                                              |
| • in operation                                                   | -25 ... +55 °C                                                                                               |
| Note                                                             | with natural convection                                                                                      |
| Ambient temperature                                              |                                                                                                              |
| • on transport                                                   | -40 ... +70 °C                                                                                               |
| Ambient temperature                                              |                                                                                                              |
| • in storage                                                     | -40 ... +70 °C                                                                                               |
| Humidity class according to EN 60721                             | Climate class 3K3, no condensation                                                                           |
| <b>Mechanics</b>                                                 |                                                                                                              |
| Connection technology                                            | screw-type terminals                                                                                         |
| Connections                                                      |                                                                                                              |
| • Supply input                                                   | L1, L2, L3, PE: Plug connector HAN Q4/2                                                                      |
| • Output                                                         | L+, M: 2 x 1.5 mm <sup>2</sup> each (4-pole cable for +/- with open, labeled ends, 4 x 1.5 mm <sup>2</sup> ) |
| • Auxiliary                                                      | Alarm signals: M12 plug-in connector 5-pin                                                                   |
| Width of the housing                                             | 310 mm                                                                                                       |
| Height of the housing                                            | 135 mm                                                                                                       |
| Depth of the housing                                             | 90 mm                                                                                                        |
| Weight, approx.                                                  | 2.8 kg                                                                                                       |
| Product feature of the housing housing for side-by-side mounting | No                                                                                                           |
| Type of fixing                                                   |                                                                                                              |
| • wall-mounting                                                  | Yes                                                                                                          |
| • cap rail mounting                                              | No                                                                                                           |
| Type of attachment S7-300 rail mounting                          | No                                                                                                           |
| Installation                                                     | Can be mounted onto ET200pro mounting rail                                                                   |
| Electrical accessories                                           | Power connector (Input: 3RK1911-2BE30 (6 mm <sup>2</sup> )) (Output: 3RK1911-2BF10 (4 mm <sup>2</sup> ))     |

# SIMATIC ET 200 distributed I/O

## ET 200pro

### SIMATIC ET200pro PS

| Ordering data                                                                                                                                                                                                                                 | Order No.                  |                                                                                                                                                                                                 | Order No.                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| <b>SIMATIC ET 200pro PS</b><br>Stabilized power supply in the design of the distributed I/O system, permitting the loop-through of energy to further modules; with degree of protection IP67;<br>input: 400-480 V 3 AC<br>Output: 24 V DC/8 A | <b>6ES7 148-4PC00-0HA0</b> |                                                                                                                                                                                                 |                                                |
|                                                                                                                                                                                                                                               |                            | <b>Accessories</b>                                                                                                                                                                              |                                                |
|                                                                                                                                                                                                                                               |                            | <b>Power connection plug</b><br>For connecting to the distributed I/O system <ul style="list-style-type: none"> <li>• For X1 (6 mm<sup>2</sup>)</li> <li>• For X2 (6 mm<sup>2</sup>)</li> </ul> | <b>3RK1 911-2BE30</b><br><b>3RK1 911-2BF10</b> |
|                                                                                                                                                                                                                                               |                            | <b>Sealing cap</b><br>For 9-pole power sockets <ul style="list-style-type: none"> <li>• X2 (1 unit)</li> <li>• X2 (10 units)</li> </ul>                                                         | <b>3RK1 902-0CJ0</b><br><b>3RK1 902-0CK00</b>  |

F: Subject to export regulations AL: N and ECCN: EAR99

I: Subject to export regulations AL: N and ECCN: EAR99H

### Overview



ET 200pro FC Standard frequency converter and converter with integral safety functions

- Two versions with and without integral safety functions
- 1.1 kW output (1.5 kW at max. 45 °C ambient temperature)
- Sensorless vector control, frequency control or torque control
- Integral brake control 180 V DC
- Regenerative feedback
- Power is looped through using jumpers with 25 A per segment
- Easy parameterization over the bus
- Extensive diagnostics

### Technical specifications

#### ET 200pro frequency converter with integral safety functions

##### Selection features

|                                                                                                   |                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Integral safety functions according to Category 3 of EN 954-1 and according to SIL 2 of IEC 61508 | <ul style="list-style-type: none"> <li>• Safe Torque Off (STO)</li> <li>• Safely Limited Speed (SLS)<sup>1)</sup></li> <li>• Safe Stop 1 (SS1)<sup>1)</sup></li> <li>• Activation of the integral safety functions through Safety Local Isolator Module F-RSM or via F-Switch PROFI-safe</li> </ul> |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

##### Electrical data

|                                                                |                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Line voltage                                                   | 380 V to 480 V 3 AC +10 % / -10 %                                                                                                                                                                                                                                                                                                                                                         |
| Output<br>(at 0 °C to 55 °C ambient temperature)               | 1.1 kW                                                                                                                                                                                                                                                                                                                                                                                    |
| Rated input current<br>(at 0 °C to 55 °C ambient temperature)  | 2.0 A                                                                                                                                                                                                                                                                                                                                                                                     |
| Rated output current<br>(at 0 °C to 55 °C ambient temperature) | 3.5 A                                                                                                                                                                                                                                                                                                                                                                                     |
| Output<br>(at 0 °C to 45 °C ambient temperature)               | 1.5 kW                                                                                                                                                                                                                                                                                                                                                                                    |
| Rated input current<br>(at 0 °C to 45 °C ambient temperature)  | 2.5 A                                                                                                                                                                                                                                                                                                                                                                                     |
| Rated output current<br>(at 0 °C to 45 °C ambient temperature) | 3.9 A                                                                                                                                                                                                                                                                                                                                                                                     |
| Line frequency                                                 | 47 Hz to 63 Hz                                                                                                                                                                                                                                                                                                                                                                            |
| Overload capability                                            | <ul style="list-style-type: none"> <li>• Overload current 1.5 x rated output current (i.e. 150 % overload) for 60 s, cycle time 300 s</li> <li>• Overload current 2 x rated output current (i.e. 200 % overload) for 3 s, cycle time 300 s</li> </ul>                                                                                                                                     |
| Output frequency                                               | 0 Hz to 650 Hz                                                                                                                                                                                                                                                                                                                                                                            |
| Pulse frequency                                                | 4 kHz (standard), 2 kHz to 16 kHz (in 2 kHz steps)                                                                                                                                                                                                                                                                                                                                        |
| SCCR (Short Circuit Current Rating) <sup>2)</sup>              | 10 kA                                                                                                                                                                                                                                                                                                                                                                                     |
| Skipped frequency range                                        | 1, programmable                                                                                                                                                                                                                                                                                                                                                                           |
| Converter efficiency                                           | ≥96 %                                                                                                                                                                                                                                                                                                                                                                                     |
| Interfaces                                                     | <ul style="list-style-type: none"> <li>• Connection to PROFIBUS (PROFINET available soon) over the ET 200pro backplane bus</li> <li>• Optical interface with USS protocol for optical RS232 connecting cable</li> <li>• Slot for an optional memory card (MMC) for uploading or downloading parameter settings</li> <li>• PTC/KTY84 interface for motor temperature monitoring</li> </ul> |

<sup>1)</sup> The safety functions "Safely Limited Speed" and "Safe Stop 1" are certified for asynchronous motors without encoders - these safety functions are not permitted for pull-through loads as in the case of lifting gear and winders.

<sup>2)</sup> Valid for industrial control cabinet installation according to NEC Article 409 / UL 508A.

# SIMATIC ET 200 distributed I/O

## ET 200pro

### ET 200pro FC frequency converter

#### Technical specifications (continued)

##### ET 200pro frequency converter with integral safety functions

###### Functions

|                                         |                                                                                                                                                                                                                                                                                      |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Open-loop/closed-loop control procedure | <ul style="list-style-type: none"> <li>V/f control – linear (<math>M\sim n</math>) with/without flux current control (FCC), quadratic (<math>M\sim n^2</math>) or parameterizable</li> <li>Vector closed-loop control without encoder</li> <li>Closed-loop torque control</li> </ul> |
| Operating functions                     | Jogging mode, free function blocks (FFB), positioning deceleration ramp, automatic restart following interruption due to power failure, bumpless connection of converter to rotating motor                                                                                           |
| Braking functions                       | <ul style="list-style-type: none"> <li>Regenerative braking operation without brake chopper and pulse resistor</li> <li>Control of an electromagnetic holding brake 180 V DC</li> </ul>                                                                                              |
| Protective functions                    | Undervoltage, overvoltage, ground faults, short circuits, stall prevention, thermal motor protection ( $I^2t$ , or sensor), converter overtemperature, motor blocking protection                                                                                                     |
| Connectable motors                      | <ul style="list-style-type: none"> <li>Low-voltage asynchronous motors</li> <li>Motor cable lengths: max. 15 m (shielded)</li> </ul>                                                                                                                                                 |

##### ET 200pro frequency converter with integral safety functions

###### Mechanical data

|                                                                   |                                                                 |
|-------------------------------------------------------------------|-----------------------------------------------------------------|
| Degree of protection                                              | IP65                                                            |
| Operating temperature                                             | 0 °C to +55 °C<br>Increased output at 0 °C to +45 °C            |
| Mounting position                                                 | Vertical wall mounting (vertical alignment of the cooling fins) |
| Mounting dimensions (W x H x D) in mm (including terminal module) | 155 x 230 x 213                                                 |
| Weight                                                            | 4.0 kg                                                          |

###### Standards

|                           |                                                                         |
|---------------------------|-------------------------------------------------------------------------|
| Compliance with standards | UL, cUL, CE, low voltage directive 2006/95/EG, EMC directive 89/336/EEC |
|---------------------------|-------------------------------------------------------------------------|

#### Derating data

##### Pulsfrequenz

| Ambient temperature °C | Rated output current in A at a pulse frequency of |       |       |       |        |        |        |        |
|------------------------|---------------------------------------------------|-------|-------|-------|--------|--------|--------|--------|
|                        | 2 kHz                                             | 4 kHz | 6 kHz | 8 kHz | 10 kHz | 12 kHz | 14 kHz | 16 kHz |
| 0 ... 55 (1.1 kW)      | 3.5                                               | 3.5   | 2.8   | 2.2   | 1.6    | 1.1    | 0.5    | -      |
| 0 ... 45 (1.5 kW)      | 3.9                                               | 3.9   | 3.9   | 3.9   | 3.4    | 3.0    | 2.6    | 2.2    |

#### Ordering data

##### Order No.



##### ET 200pro FC frequency converter with integral safety functions

380 V – 480 V 3 AC +10/-10 %  
47 Hz – 63 Hz

Overload:  
150 % 60 s  
200 % 3 s

Output:  
1.1 kW (0 ° ... 55 °C)  
1.5 kW (0 ° ... 45 °C)

E 6SL3 235-0TE21-1SB0

E: Subject to export regulations AL: 9I999 and ECCN: EAR99

# SIMATIC ET 200 distributed I/O

## ET 200pro

### ET 200pro FC frequency converter

#### Ordering data

#### Order No.



#### ET 200pro FC Standard frequency converter

380 V – 480 V 3 AC +10/-10 %  
47 Hz – 63 Hz

150 %, 60s  
200 % 3s

#### Output:

1.1 kW (0 ° ... 55 °C)  
1.5 kW (0 ° ... 45 °C)

E **6SL3 235-0TE21-1RB0**

#### Backplane bus module to hold the frequency converter

E **6SL3 260-2TA00-0AA0**

E: Subject to export regulations AL: 91999 and ECCN: EAR99

#### Accessories:

#### Accessories

#### Order No.

#### Order No.

#### Connector set

for energy supply, HAN Q4/22  
2.5mm<sup>2</sup>  
4.0 mm<sup>2</sup>  
6.0 mm<sup>2</sup>

**3RK1 911-2BE50**

**3RK1 911-2BE10**

**3RK1 911-2BE30**

#### Motor cables

#### Motor cables prefabricated at one end

For motors with brake and temperature sensor with HAN Q8 connector, shielded

Cross-section 1 mm<sup>2</sup>

- Length 1.5 m
- Length 3 m
- Length 5 m
- Length 10 m

(HTG: supplied from the Harting Company) (ZKT: supplied from the KnorrTec Company)

**ZKT: 70018601000150**

**ZKT: 70018601000300**

**ZKT: 70018601000500**

**ZKT: 70018601001000**

Cross-section 1.5 mm<sup>2</sup>

- Length 1.5 m
- Length 3 m
- Length 5 m
- Length 10 m

**HTG: 61 88 201 0288**

**HTG: 61 88 201 0289**

**HTG: 61 88 201 0290**

**HTG: 61 88 201 0299**

Further selected accessories are available from Siemens Solution Partners. Select "Distributed Field Installation System" as technology in the "Solution Partner Finder".

[www.siemens.com/automation/partnerfinder](http://www.siemens.com/automation/partnerfinder)

#### Frequency converter connector

for motor cable, shielded, HAN Q8

**6ES7 194-1AB01-0XA0**

#### Power jumper plug

for 400 V power transmission to following 400 V modules

**3RK1 922-2BQ00**

#### USB interface cable

for communication with a PC (2.5 m long)

E **6SL3 555-0PA00-2AA0**

#### RS232 interface cable

for parameterizing the converter with the STARTER tool via a direct point-to-point connection

**3RK1 922-2BP00**

#### IOP Handheld

For use with SINAMICS G120, SINAMICS G110D, SINAMICS G120D, SIMATIC ET 200S FC or SIMATIC ET 200pro FC

Included in the scope of delivery:

- IOP
- Handheld housing
- Rechargeable batteries (4 × AA)
- Charging unit (international)
- RS232 connecting cable (3 m long, can only be used for SINAMICS G120 and SIMATIC ET 200S FC)
- USB cable (1 m long)

E **6SL3 255-0AA00-4HA0**

#### Memory card (MMC)

for parameter settings of the ET 200S FC and ET 200pro FC. If required, the complete parameter settings of the frequency converter can be saved on a memory card (MMC). When servicing, the plant is immediately ready for use again after replacing the frequency converter and inserting the memory card.

E **6SL3 254-0AM00-0AA0**

E: Subject to export regulations AL: 91999 and ECCN: EAR99

# SIMATIC ET 200 distributed I/O

## ET 200pro

### ET 200pro motor starter General data

#### Overview



ET 200pro motor starter: Isolator module, Standard starter and High-Feature starter mounted on a wide module rack

#### Motor starters

- Only two versions up to 5.5 kW
- All settings can be parameterized by bus
- Comprehensive diagnostic signals
- Overload can be acknowledged by remote reset
- Current unbalance monitoring
- Stall protection
- Emergency start function in the event of overload
- Current value transmission by bus
- Current limit monitoring
- Direct-on-line or reversing starters
- Power bus can be plugged in using the new HAN Q4/2
- Plug-in connectors
- Conductor cross-sections up to 6 x 4 mm<sup>2</sup>
- 25 A per segment (power looped through using jumper plug)
- In the Standard and High-Feature versions (with 4 DI onBoard)
- Electromechanical switching and electronic switching
- Electronic starter for direct activation or with integrated smooth-starter function
- Supplied with 400 V AC brake contact as an option.

#### Isolator modules

The isolator module with switch disconnecter function is used for safe disconnection of the 400 V operational voltage during repair work in the plant and provides an integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters).

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

#### Safety applications

##### Safety local isolator module

With the Safety local modules

- Safety local isolator module and
- 400 V disconnecting module

it is possible to achieve safety category 4/SIL 3 with an appropriate connection.

##### Safety Solution PROFIsafe

With the Safety PROFIsafe modules

- F-Switch and
- 400 V disconnecting module

it is likewise possible to achieve safety category 4/SIL 3 with an appropriate connection.

#### Motor Starter ES software

The Motor Starter ES software is used for parameterization, monitoring, diagnostics and testing of motor starters.

See page 9/180.

#### Application

With the ET 200pro motor starters, any AC loads can be protected and switched. They are an integral part of ET 200pro and have the high degree of protection IP65. This makes them ideal for operation in modular, distributed peripherals without control cabinets or control enclosures.

The ET 200pro motor starters are available both with mechanical as well as electronic contacts

The ET 200pro electromechanical starters are offered as direct (DSe/DSe) and reversing starters (RSe/RSe) in the High-Feature version with the following equipment:

- 4 digital inputs
- Device versions with or without control for externally fed brakes with 400 V AC
- With expanded parameterization capabilities.

The ET 200pro electronic starters are offered as direct (DSe/DSe) and reversing starters (RSe/RSe) in the High-Feature version with the following equipment:

- 4 digital inputs
- With soft-start and smooth ramp-down function
- With the deactivated smooth start function as an electronic starter for applications with a high level of switching frequency
- Device versions with or without control for externally fed brakes with 400 V AC
- With expanded parameterization capabilities.

As the result of the protection concept with solid-state overload evaluation and the use of SIRIUS controls size S00, additional advantages are realized on the standard and High-Feature motor starters - advantages which soon make themselves positively felt particularly in manufacturing processes with high plant stoppage costs:

- Configuration is made easier by the fine modular structure. When using the ET 200pro motor starters, the list of parts per load feeder is reduced to two main units: the bus module and the motor starter. This makes the ET 200pro ideal for modular machine concepts or solutions for conveying systems and in machine-tool building.
- Expansions are easily possible through the subsequent adding of modules. The innovative plug-in technology also does away with the wiring needed up to now. Through the hot swapping function (disconnection and connection during operation) a motor starter can be replaced within seconds if necessary, without having to shut down the ET 200pro station and with it the process in the plant. The motor starters are therefore recommendable in particular for applications with special demands on availability. Storage costs are optimized in addition by the low level of variance (2 units up to 5.5 kW).

The ordering option for motor starters with a 400 V AC brake output provides the possibility of controlling motors with 400 V AC brakes. With four locally acting inputs available on the High-Feature motor starter it is possible to realize autonomous special functions which work independently of the bus and the higher level control system, e.g. as a quick stop on gate valve controls or limit position disconnectors. In parallel with this, the states of these inputs are signaled to the control system.



**Overview** (continued)

When using the optional isolator module with switch disconnect and group fusing function for the ET 200pro, the 400 V supply of the motor starters can be switched on and off directly in the field, i.e. locally.

The Motor Starter ES software is available for the parameterization and diagnostics.

See Chapter 12 "Planning, Configuration and Visualization with SIRIUS".

**Technical specifications**

|                                                                     |  | Standard<br>motor starters<br>DSe, RSe            | High-Feature<br>motor starters<br>DSe, RSe | sDSSSte, sDSte,<br>sRSSSte, sRSte |
|---------------------------------------------------------------------|--|---------------------------------------------------|--------------------------------------------|-----------------------------------|
| Device functions                                                    |  |                                                   |                                            |                                   |
| Parameterizable rated operational current                           |  | Yes                                               |                                            |                                   |
| Parameterizable current limit values                                |  | No                                                | Yes, 2 limit values                        |                                   |
| Parameterizable response in case of current limit violation         |  | No                                                | Yes                                        |                                   |
| Zero current monitoring                                             |  | Yes                                               |                                            |                                   |
| Parameterizable response in case of zero current violation          |  | Yes                                               |                                            |                                   |
| Parameterizable current unbalance limit                             |  | No, fixed limit value<br>(30 % x I <sub>e</sub> ) | Yes, 30 % ... 60 % x I <sub>e</sub>        |                                   |
| Parameterizable response in case of unbalance limit violation       |  | Yes                                               |                                            |                                   |
| Motor blocking monitoring                                           |  | No                                                | Yes                                        |                                   |
| Parameterizable blocking current limit                              |  | No                                                | Yes, 150 % ... 1000 % x I <sub>e</sub>     |                                   |
| Parameterizable blocking time limit                                 |  | s                                                 | No                                         | Yes, 1 ... 5                      |
| Current value transmission                                          |  | Yes                                               |                                            |                                   |
| Group warning diagnostics                                           |  | No                                                | Yes, parameterizable                       |                                   |
| Group diagnostics                                                   |  | Yes, parameterizable                              |                                            |                                   |
| Emergency start                                                     |  | Yes                                               |                                            |                                   |
| Digital inputs                                                      |  | No                                                | Yes, 4 inputs                              |                                   |
| • Parameterizable input signal                                      |  | No                                                | Yes, latching/ non-latching                |                                   |
| • Parameterizable input level                                       |  | No                                                | Yes, NC contacts/NO contacts               |                                   |
| • Parameterizable input signal delay                                |  | ms                                                | No                                         | Yes, 10 ... 80                    |
| • Parameterizable input signal extension                            |  | ms                                                | No                                         | Yes, 0 ... 200                    |
| • Parameterizable input control actions                             |  | No                                                | Yes, 12 different actions                  |                                   |
| 400 V brake output                                                  |  | Yes, ordering option                              |                                            |                                   |
| Parameterizable brake enabling delay                                |  | s                                                 | Yes, -2.5 ... 2.5                          |                                   |
| Parameterizable holding time of the brake during stopping           |  | s                                                 | Yes, 0 ... 25                              |                                   |
| Parameterizable start-up type                                       |  | No                                                | Yes                                        |                                   |
| Parameterizable ramp-down time                                      |  | No                                                | Yes                                        |                                   |
| Parameterizable starting voltage                                    |  | No                                                | Yes                                        |                                   |
| Parameterizable stopping voltage                                    |  | No                                                | Yes                                        |                                   |
| Local device interface                                              |  | Yes                                               |                                            |                                   |
| Firmware update                                                     |  | Yes, by trained personnel                         |                                            |                                   |
| Thermal motor model                                                 |  | Yes                                               |                                            |                                   |
| Parameterizable trip class                                          |  | No, CLASS 10 fixed                                | Yes, CLASS 5, 10, 15, 20                   |                                   |
| Parameterizable response in case of overload of thermal motor model |  | No                                                | Yes, 3 possible states                     |                                   |
| Advance warning limit for motor heating                             |  | %                                                 | No                                         | Yes, parameterizable 0 ... 95     |
| Advance warning limit time-related trip reserve                     |  | s                                                 | No                                         | Yes, parameterizable 0 ... 500    |
| Parameterizable recovery time                                       |  | min                                               | No                                         | Yes, 1 ... 30                     |
| Parameterizable protection against voltage failure                  |  | No, permanently integrated                        | Yes                                        |                                   |
| Reversing start function                                            |  | Yes, ordering option                              |                                            |                                   |
| Parameterizable interlock time for reversing starters               |  | No, 150 ms fixed                                  | Yes, 0 ... 60s                             |                                   |
| Integrated logbook functions                                        |  | Yes, 3 device logbooks                            |                                            |                                   |
| Integrated statistics data memory                                   |  | Yes                                               |                                            |                                   |
| Parameterizable response in case of CPU / master stop               |  | Yes                                               |                                            |                                   |
| Device indications                                                  |  |                                                   |                                            |                                   |
| • Group fault                                                       |  | SF LED (red)                                      |                                            |                                   |
| • Switching state                                                   |  | STATE LED (red, yellow, green)                    |                                            |                                   |
| • Device status                                                     |  | DEVICE LED (red, yellow, green)                   |                                            |                                   |
| • Digital inputs                                                    |  | No                                                | IN 1 ... IN 4, LED                         |                                   |



## SIMATIC ET 200 distributed I/O

## ET 200pro

ET 200pro motor starter  
General data

## Technical specifications (continued)

|                                                                                   |                 | Standard motor starters                                                                   | High-Feature motor starters      |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------|
|                                                                                   |                 | Mechanical switching without inputs                                                       | Mechanical switching with inputs | Electronic switching with inputs and soft starter function                          |
| Technology designation <sup>4)</sup>                                              |                 | DSe, RSe                                                                                  | DSe, RSe                         | sDSSSte, sDSte, sRSSte, sRSte                                                       |
| Mechanics and environment                                                         |                 |                                                                                           |                                  |                                                                                     |
| Motor starters that can be connected to ET 200pro or modules with width of 110 mm |                 | max. 8                                                                                    |                                  |                                                                                     |
| Mounting dimensions (W x H x D)                                                   |                 |                                                                                           |                                  |                                                                                     |
| • Direct-on-line starter and reversing starter                                    | mm              | 110 x 230 x 150                                                                           |                                  | 110 x 230 x 160                                                                     |
| Permissible ambient temperature                                                   |                 |                                                                                           |                                  |                                                                                     |
| • During operation                                                                | °C              | -25 ... +55, from +40 with derating                                                       |                                  |                                                                                     |
| • During storage                                                                  | °C              | -40 ... +70                                                                               |                                  |                                                                                     |
| Permissible mounting positions                                                    |                 | Vertical, horizontal                                                                      |                                  |                                                                                     |
| Vibration resistance acc. to IEC 60068, Part 2-6                                  |                 | 2 g                                                                                       |                                  |                                                                                     |
| Shock resistance acc. to IEC 60068 Part 2-27                                      |                 | Half-sine 15 g/11 ms                                                                      |                                  |                                                                                     |
| Degree of protection                                                              |                 | IP65                                                                                      |                                  |                                                                                     |
| Pollution degree                                                                  |                 | 3, IEC 60664 (IEC 61131)                                                                  |                                  |                                                                                     |
| Electrical specifications                                                         |                 |                                                                                           |                                  |                                                                                     |
| Power consumption at 24 V DC                                                      |                 |                                                                                           |                                  |                                                                                     |
| • From auxiliary circuit L+/M (U1)                                                | mA              | Approx. 40                                                                                |                                  |                                                                                     |
| • From auxiliary circuit A1/A2 (U2)                                               | mA              | Approx. 200                                                                               |                                  |                                                                                     |
| Rated operational current for power bus I <sub>e</sub>                            | A               | 25                                                                                        |                                  |                                                                                     |
| Rated operational voltage U <sub>e</sub>                                          |                 |                                                                                           |                                  |                                                                                     |
| • Approval according to EN 60947-1, Appendix N                                    | V AC            | 400 (50/60 Hz)                                                                            |                                  |                                                                                     |
| • Approval according to CSA and UL                                                | V AC            | Up to 400 (50/60 Hz)                                                                      |                                  | Up to 400 (50/60 Hz)                                                                |
|                                                                                   | V AC            | Up to 600 (50/60 Hz)                                                                      |                                  | Up to 480 (50/60 Hz)                                                                |
| Approval                                                                          |                 |                                                                                           |                                  |                                                                                     |
| • VDE 0106, Part 101                                                              | V               | Up to 400                                                                                 |                                  | Up to 480                                                                           |
| • CSA and UL approval                                                             | V               | Up to 600                                                                                 |                                  | Up to 480                                                                           |
| Conductor cross-sections                                                          |                 |                                                                                           |                                  |                                                                                     |
| • Incoming energy supply                                                          | mm <sup>2</sup> | Max. 6 x 4                                                                                |                                  |                                                                                     |
| Touch protection                                                                  |                 | Finger-safe                                                                               |                                  |                                                                                     |
| Rated impulse withstand voltage U <sub>imp</sub>                                  | kV              | 6                                                                                         |                                  |                                                                                     |
| Rated insulation voltage U <sub>i</sub>                                           | V               | 400                                                                                       |                                  |                                                                                     |
| Rated operational current for starters I <sub>e</sub>                             |                 |                                                                                           |                                  |                                                                                     |
| • AC-1/2/3 at 40 °C                                                               |                 |                                                                                           |                                  |                                                                                     |
| - At 400 V                                                                        | A               | 0.15 ... 2.0/1.5 ... 12.0                                                                 |                                  | 0.15 ... 2.0/1.5 ... 12.0 <sup>1)</sup>                                             |
| - At 500 V                                                                        | A               | 0.15 ... 2.0/1.5 ... 9.0                                                                  |                                  |                                                                                     |
| • AC-4 at 40 °C                                                                   |                 |                                                                                           |                                  |                                                                                     |
| - At 400 V                                                                        | A               | 0.15 ... 2.0/1.5 ... 4.0                                                                  |                                  |                                                                                     |
| Rated short-circuit breaking capacity                                             | kA              | 100 at 400 V                                                                              |                                  |                                                                                     |
| Type of coordination acc. to IEC 60947-4-1                                        |                 | 1                                                                                         |                                  |                                                                                     |
| Power of induction motors at 400 V                                                | kW              | Max. 5.5                                                                                  |                                  | Max. 5.5/4 <sup>2)</sup>                                                            |
| Utilization categories                                                            |                 | AC-1, AC-2, AC-3, AC-4                                                                    |                                  | AC-53a <sup>3)</sup> (max. 9 A with deactivated soft start function up to CLASS 10) |
| Protective separation between main and auxiliary circuits                         | V               | 400, Acc. to EN 60947-1, Appendix N                                                       |                                  |                                                                                     |
| Endurance of contactor                                                            |                 |                                                                                           |                                  |                                                                                     |
| • Mechanical                                                                      |                 | 30 million operating cycles                                                               |                                  | --                                                                                  |
| • Electrical                                                                      |                 | Up to 10 million operating cycles; dependent on the current loading (see Manual)          |                                  | --                                                                                  |
| Reliable switching frequency                                                      |                 | Dependent on the current loading, motor starting time and relative ON period (see Manual) |                                  |                                                                                     |
| Operating times at 0.85 ... 1.1 x U <sub>e</sub>                                  |                 |                                                                                           |                                  |                                                                                     |
| • Closing delay                                                                   | ms              | 11 ... 50                                                                                 |                                  | --                                                                                  |
| • Opening delay                                                                   | ms              | 5 ... 45                                                                                  |                                  | --                                                                                  |

## 1) Caution!

With deactivated soft starter control function the permissible rated operational current is reduced to 9 A up to CLASS 10.

2) With parameterization as electronic starter max. 4 kW.

3) 8-hour operation.

4) DS ... direct-on-line starter  
RS ... reversing starter  
DSS ... direct-on-line soft starters  
RSS ... reversing starter  
e ..... electronic motor protection  
te ..... full motor protection (thermal + electronic)  
s ..... electronic switching with semiconductor

## Ordering data

| Version                                                                                                                               |                                                                                                                                                                                                       | Order No.                                  |
|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Standard motor starters, mechanical<br>Motor protection: thermal model                                                                |                                                                                                                                                                                                       |                                            |
|                                                      | <b>DSe direct-on-line starters<sup>1)</sup></b> <ul style="list-style-type: none"><li>• Without brake output</li><li>• With brake output 400 V AC</li></ul>                                           | 3RK1 304-5□S40-4AA0<br>3RK1 304-5□S40-4AA3 |
|                                                                                                                                       | <b>RSe reversing starters<sup>1)</sup></b> <ul style="list-style-type: none"><li>• Without brake output</li><li>• With brake output 400 V AC</li></ul>                                                | 3RK1 304-5□S40-5AA0<br>3RK1 304-5□S40-5AA3 |
| DSe Standard                                                                                                                          |                                                                                                                                                                                                       |                                            |
| High-Feature motor starters, mechanical<br>Motor protection: thermal model                                                            |                                                                                                                                                                                                       |                                            |
|                                                      | <b>DSe direct-on-line starters<sup>1)</sup></b> <ul style="list-style-type: none"><li>• Without brake output and with 4 inputs</li><li>• With brake output 400 V AC and 4 inputs</li></ul>            | 3RK1 304-5□S40-2AA0<br>3RK1 304-5□S40-2AA3 |
|                                                                                                                                       | <b>RSe reversing starters<sup>1)</sup></b> <ul style="list-style-type: none"><li>• Without brake output and with 4 inputs</li><li>• With brake output 400 V AC and 4 inputs</li></ul>                 | 3RK1 304-5□S40-3AA0<br>3RK1 304-5□S40-3AA3 |
| Setting range<br>Rated operational current                                                                                            |                                                                                                                                                                                                       | K<br>L                                     |
| <ul style="list-style-type: none"><li>• 0.15 ... 2.0 A</li><li>• 1.5 ... 12.0 A</li></ul>                                             |                                                                                                                                                                                                       |                                            |
| High-Feature motor starters, electronic<br>Full motor protection, comprising thermal motor protection and thermistor motor protection |                                                                                                                                                                                                       |                                            |
|                                                    | <b>sDSSte/sDSte direct-on-line starters<sup>1)2)</sup></b> <ul style="list-style-type: none"><li>• Without brake output and with 4 inputs</li><li>• With brake output 400 V AC and 4 inputs</li></ul> | 3RK1 304-5□S70-2AA0<br>3RK1 304-5□S70-2AA3 |
|                                                                                                                                       | <b>sRSSte/sRSte reversing starters<sup>1)2)</sup></b> <ul style="list-style-type: none"><li>• Without brake output and with 4 inputs</li><li>• With brake output 400 V AC and 4 inputs</li></ul>      | 3RK1 304-5□S70-3AA0<br>3RK1 304-5□S70-3AA3 |
| Setting range<br>Rated operational current                                                                                            |                                                                                                                                                                                                       | K<br>L                                     |
| <ul style="list-style-type: none"><li>• 0.15 ... 2.0 A</li><li>• 1.5 ... 12.0 A</li></ul>                                             |                                                                                                                                                                                                       |                                            |
| sRSSte High-Feature                                                                                                                   |                                                                                                                                                                                                       |                                            |

<sup>1)</sup> Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for motor starters ET 200pro").

<sup>2)</sup> Delivery time class A for setting range rated operational current 0.15 ... 2.0 A

<sup>3)</sup> The solid-state motor starters can be used not only as solid-state motors starters with a high level of switching frequency but also as fully fledged soft starters for soft starting and smooth ramp-down. The changeover from motor starter to soft starter takes place through reparameterization in HW Config.

Depending on the setting, this results in the following current ranges:  
 - Parameterization as solid-state starter: 0.15 ... 2 A and 1.5 ... 9 A (4 kW)  
 - Parameterization as soft starter: 0.15 ... 2 A and 1.5 ... 12 A (5.5 kW).

# SIMATIC ET 200 distributed I/O

## ET 200pro

### ET 200pro isolator module

#### Overview

The isolator module with integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters) and switch disconnecter function is used for safe disconnection of the 400 V operational voltage in the plant.

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

The isolator module is available in addition in a safety version (see [Safety local isolator module, page 9/315](#)):

The following properties apply to the isolator module:

- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Cabinet-free construction thanks to high degree of protection IP65.

#### Technical Specifications

| General data                                    |                 | Isolator modules     |
|-------------------------------------------------|-----------------|----------------------|
| Mounting dimensions (W x H x D)                 |                 | 110 x 230 x 170      |
| • Direct-on-line starter and reversing starter  | mm              |                      |
| Permissible ambient temperature                 |                 |                      |
| • During operation                              | °C              | -25 ... +55          |
| • During storage                                | °C              | -40 ... +70          |
| Permissible mounting positions                  |                 | Any                  |
| Vibration resistance acc. to IEC 60068 Part 2-6 |                 | 2 g                  |
| Shock resistance acc. to IEC 60068 Part 2-27    |                 | Half-sine 15 g/11 ms |
| Power consumption                               |                 |                      |
| • From auxiliary circuit L+/M (U1)              | mA              | Approx. 20           |
| • From auxiliary circuit A1/A2 (U2)             |                 | --                   |
| Rated operational current for power bus $I_e$   | A               | 25                   |
| Rated operational voltage $U_e$                 | V               | 400                  |
| Approvals according to                          |                 |                      |
| • DIN VDE 0106, Part 101                        | V               | Up to 500            |
| • CSA and UL                                    | V               | Up to 600            |
| Conductor cross-sections                        |                 |                      |
| • Incoming energy supply                        | mm <sup>2</sup> | Max. 6 x 4           |

| Isolator modules                                          |    | Isolator modules          |
|-----------------------------------------------------------|----|---------------------------|
| Degree of protection                                      |    | IP65                      |
| Touch protection                                          |    | Finger-safe               |
| Pollution degree                                          |    | 3, IEC 60664 (IEC 61131)  |
| Rated impulse withstand voltage $U_{imp}$                 | kV | 6                         |
| Rated insulation voltage $U_i$                            | V  | 400                       |
| Rated operational current for starters $I_e$              |    |                           |
| • AC-1/2/3 at 40 °C                                       |    |                           |
| - At 400 V                                                | A  | 25                        |
| - At 500 V                                                | A  | 25                        |
| Rated short-circuit breaking capacity                     | kA | 50 at 400 V               |
| Type of coordination acc. to IEC 60947-4-1                |    | 2                         |
| Protective separation between main and auxiliary circuits | V  | 400, to VDE 0106 Part 101 |
| <b>Device functions</b>                                   |    |                           |
| • Group diagnostics                                       |    | Yes, parameterizable      |
| <b>Device indications</b>                                 |    |                           |
| • Group fault                                             |    | SF LED (red)              |

#### Ordering data

| Version | Order No. |
|---------|-----------|
|---------|-----------|

#### ET 200pro isolator modules, mechanical



3RK1 304-0HS00-6AA0

#### Isolator modules<sup>1)</sup>

Rated operational current 25 A

**3RK1 304-0HS00-6AA0**

<sup>1)</sup> Only functions when used together with the related 110 mm backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see [Accessories formotor starters ET 200pro](#)).

**Overview**

ET 200pro motor starter: Safety local isolator module, disconnecting module, Standard starter and High-Feature starter mounted on a wide module rack

**Safety local isolator module**

The Safety local isolator module is a repair switch with integrated safety evaluation functions that can be parameterized using DIP switches.

It is used for:

- Connection of a 1 or 2-channel EMERGENCY-STOP circuit up to Category 3-4/SIL 3 (protective door or EMERGENCY-STOP pushbuttons) and parameterizable start behavior
- Control of the 400 V disconnecting module by means of a safety rail signal

**400 V disconnecting module**

The 400 V disconnecting module enables the safe disconnection of an operational voltage of 400 V up to Category 3-4/SIL 3. For operation in a Safety Solution local application it functions only in combination with the Safety local isolator module.

For operation in a Safety PROFIsafe application it functions only in combination with the F-Switch.

**F-Switch**

Fail-safe digital inputs/outputs in degree of protection IP65/66/67 for near-machine, cabinet-free use.

**Fail-safe digital inputs**

- For the fail-safe reading in of sensor information (1-/2-channel)
- Including integrated discrepancy evaluation for 2v2 signals
- Internal sensor supplies (incl. testing) available

**Fail-safe digital outputs**

- 3 fail-safe PP-switching outputs for safe switching of the backplane bus bars

The F-Switch is certified up to Category 4 (EN 954-1) and up to SIL 3 (IEC 61508) and has detailed diagnostics.

It supports PROFIsafe in PROFIBUS configurations as well as in PROFINET configurations.

**Application****Safety local isolator module**

The Safety local isolator module features the same functions as a standard isolator module with an additional local safety function.

The Safety local isolator module contains a 3TK28 41 module and is equipped with M12 terminals for the connection of external safety components.

Terminals 1 and 2 can be used to connect either 1-channel or 2-channel EMERGENCY-STOP circuits or protective door circuits (IN 1, IN 2).

For monitored starts, an external START switch can be connected to terminal 3.

The required safety functions can be set using 2 slide switches located under the left M12 opening.

In the event of an EMERGENCY-STOP, the Safety local isolator module trips the downstream 400 V disconnecting module. This safely isolates the 400 V circuit up to Category 4/SIL 3.

In combination with the 400 V disconnecting module, the Safety local isolator module can be used for safety applications up to Category 4/SIL 3 according to EN ISO 13849-1 / IEC 61508 1-4.

**400 V disconnecting module**

The 400 V disconnecting module can be used for local safety applications in combination with the Safety local isolator module, and for PROFIsafe safety applications in combination with the F-Switch.

It contains 2 contactors connected in series for the safety-oriented disconnection of the main circuit.

The auxiliary circuit supply of the device is implemented via a safety busbar in the backplane module.

The 400 V disconnecting module can be used in combination with the Safety local isolator module or with the F-Switch for safety applications up to Cat. 4/SIL 3 according to EN ISO 13849-1/IEC 61508 1-4.

**F-Switch**

The F-Switch is a fail-safe solid-state module for PROFIsafe safety applications. It has two fail-safe inputs and outputs for safe switching of the 24 V supply over backplane bus bars. In combination with the 400 V disconnecting module it can be used in PROFIsafe applications for the fail-safe disconnection of ET 200pro motor starters up to Category 4/SIL 3.

## SIMATIC ET 200 distributed I/O

## ET 200pro

## ET 200pro safety motor starter

## Solutions local/PROFIsafe – safety module

## Technical specifications

|                                                           |                 | Safety local isolator module   | 400 V disconnecting module |
|-----------------------------------------------------------|-----------------|--------------------------------|----------------------------|
| <b>General data</b>                                       |                 |                                |                            |
| Mounting dimensions (W x H x D) in mm                     | mm              | 110 x 230 x 170                | 110 x 230 x 150            |
| • Direct-on-line starter and reversing starter            |                 |                                |                            |
| Permissible ambient temperature                           | °C              | -25 ... +55                    |                            |
| • During operation                                        | °C              | -40 ... +70                    |                            |
| • During storage                                          |                 |                                |                            |
| Permissible mounting positions                            |                 | Any                            |                            |
| Vibration resistance acc. to IEC 60068, Part 2-6          |                 | 2 g                            |                            |
| Shock resistance acc. to IEC 60068 Part 2-27              |                 | Half-sine 15 g/11 ms           |                            |
| Power consumption                                         |                 |                                |                            |
| • From auxiliary circuit L+/M (U1)                        | mA              | Approx. 20                     |                            |
| • From auxiliary circuit A1/A2 (U2)                       |                 | --                             |                            |
| Rated operational current for power bus $I_e$             | A               | 25                             |                            |
| Rated operational voltage $U_e$                           | V               | 400 (50/60 Hz)                 |                            |
| Approval to DIN VDE 0106 Part 101                         | V               | Up to 500                      |                            |
| CSA and UL approval                                       | V               | Up to 600                      |                            |
| Conductor cross-sections                                  | mm <sup>2</sup> | Max. 6 x 4                     |                            |
| Incoming energy supply                                    |                 |                                |                            |
| Degree of protection                                      |                 | IP65                           |                            |
| Touch protection                                          |                 | Finger-safe                    |                            |
| Pollution degree                                          |                 | 3, IEC 60664 (IEC 61131)       |                            |
| Rated impulse withstand voltage $U_{imp}$                 | kV              | 6                              |                            |
| Rated insulation voltage $U_i$                            | V               | 400                            |                            |
| Rated operational current for starter $I_e$               |                 |                                |                            |
| • AC-1/2/3 at 40 °C                                       |                 |                                |                            |
| - At 400 V                                                | A               | 16                             | 25                         |
| - At 500 V                                                | A               | 16                             | 25                         |
| Rated short-circuit breaking capacity                     | kA              | 50 at 400 V                    |                            |
| Type of coordination acc. to IEC 60947-4-1                |                 | 2                              |                            |
| Protective separation between main and auxiliary circuits | V               | 400, acc. to VDE 0106 Part 101 |                            |
| Operating times at 0.85 ... 1.1 x $U_e$                   |                 |                                |                            |
| • Closing delay                                           | ms              | --                             | 25 ... 100                 |
| • Opening delay                                           | ms              | --                             | 7 ... 10                   |
| <b>Device functions</b>                                   |                 |                                |                            |
| • Group diagnostics                                       |                 | Yes, parameterizable           |                            |
| <b>Device indications</b>                                 |                 |                                |                            |
| • Group fault                                             |                 | SF LED (red)                   |                            |

## Ordering data

| Version                                                                                                  |                                                                                                             | Order No.                  |
|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Safety modules ET 200pro</b>                                                                          |                                                                                                             |                            |
| <br>3RK1 304-0HS00-7AA0 | <b>Safety local isolator modules<sup>1)2)</sup></b><br>Rated operational current 16 A                       | <b>3RK1 304-0HS00-7AA0</b> |
|                                                                                                          | <br>3RK1 304-0HS00-8AA0    | <b>3RK1 304-0HS00-8AA0</b> |
|                                                                                                          | <b>F-Switch PROFIsafe</b><br>24 V DC,<br>including bus module<br>Connection module to be ordered separately | <b>6ES7 148-4FS00-0AB0</b> |
|                                                                                                          | <br>6ES7 148-1FS00-0AB0   | <b>6ES7 194-4DA00-0AA0</b> |

<sup>1)</sup> The Safety local isolator module only functions when used together with the 400 V disconnecting module.

<sup>2)</sup> Only in combination with the special backplane bus module for the Safety local isolator module (see ["Accessories for motor starters ET 200pro"](#)).

<sup>3)</sup> The 400 V disconnecting module only functions when used together with the Safety local isolator module or with the F-Switch.

<sup>4)</sup> Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see ["Accessories for motor starters ET 200pro"](#)).

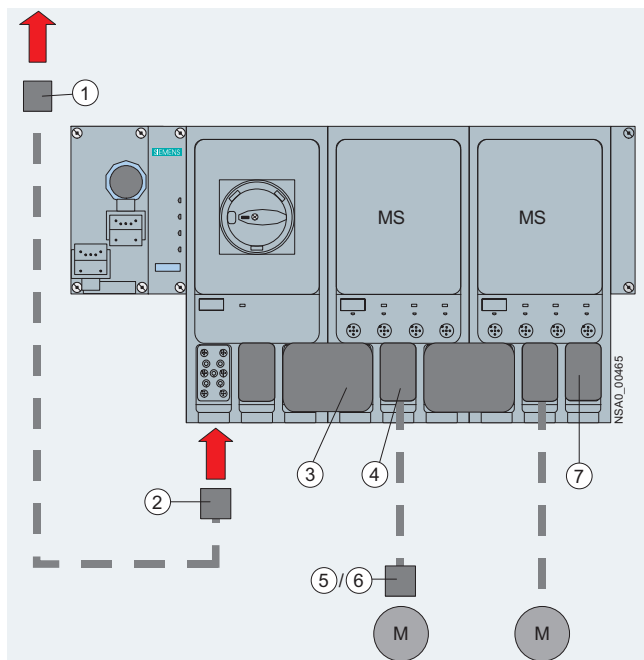
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# SIMATIC ET 200 distributed I/O

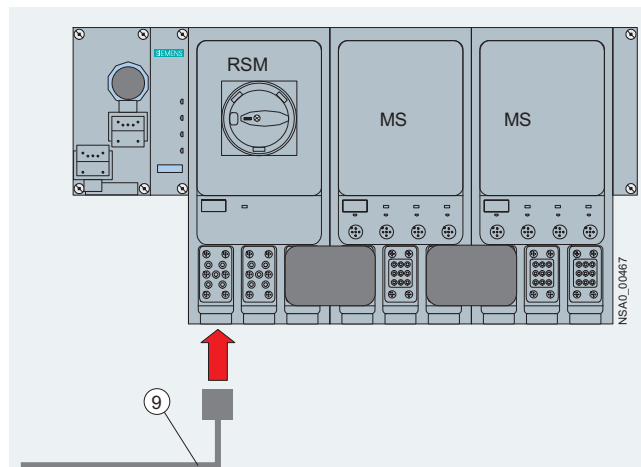
## ET 200pro

### Accessories for ET 200pro motor starters

#### Overview



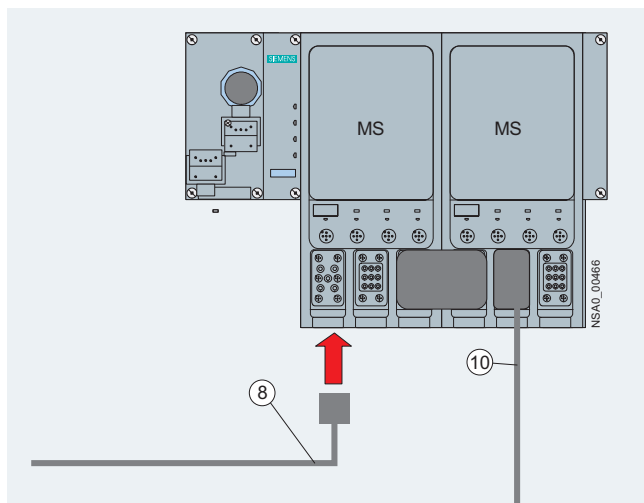
Basic design of an motor starter ET 200pro



Infeed on the RSM isolator module

Legend:

- ① Power feeder plug ([see page 9/319](#))
- ② Power connection plug ([see page 9/319](#))
- ③ Power jumper plug ([see page 9/319](#))
- ④ Motor connection plug ([see page 9/319](#))
- ⑤ Motor plug ([see page 9/319](#))
- ⑥ Motor plug with EMC suppressor circuit ([see page 9/319](#))
- ⑦ Power loop-through plug ([see page 9/319](#))
- ⑧ Power connection cable ([see page 9/319](#))
- ⑨ Power connection cable for isolator modules ([see page 9/319](#))
- ⑩ Motor cable ([see page 9/320](#))



Infeed on the motor starter ET 200pro

## Ordering data

| Version                                                                                                                                                                                                                                                                                                                                                                                                                               | Order No.                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b>ET 200pro accessories</b>                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                         |
| <b>① Power feeder plugs</b><br>Connector set for energy supply, e.g. for connecting to T terminal connectors, comprising a coupling enclosure, straight outgoing feeder (with bracket), pin insert for HAN Q4/2, incl. gland <ul style="list-style-type: none"> <li>• 5 male contacts 2.5 mm<sup>2</sup></li> <li>• 5 male contacts 4 mm<sup>2</sup></li> <li>• 5 male contacts 6 mm<sup>2</sup></li> </ul>                           | <b>3RK1 911-2BS60</b><br><b>3RK1 911-2BS20</b><br><b>3RK1 911-2BS40</b> |
| <b>② Power connection plugs</b><br>Connector set for energy supply for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angled outgoing feeder, female insert for HAN Q4/2, incl. gland <ul style="list-style-type: none"> <li>• 5 female contacts 2.5 mm<sup>2</sup></li> <li>• 5 female contacts 4 mm<sup>2</sup></li> <li>• 5 female contacts 6 mm<sup>2</sup></li> </ul> | <b>3RK1 911-2BE50</b><br><b>3RK1 911-2BE10</b><br><b>3RK1 911-2BE30</b> |
| <b>③ Power jumper plugs</b>                                                                                                                                                                                                                                                                                                                                                                                                           | <b>3RK1 922-2BQ00</b>                                                   |
| <b>④ Motor connection plugs</b><br>Connector set for motor cable for connection to ET 200pro motor starters, comprising a cable-end connector hood, angular outgoing feeder, pin insert for HAN Q8/0, incl. gland <ul style="list-style-type: none"> <li>• 8 male contacts 1.5 mm<sup>2</sup></li> <li>• 6 male contacts 2.5 mm<sup>2</sup></li> </ul>                                                                                | F <b>3RK1 902-0CE00</b><br>F <b>3RK1 902-0CC00</b>                      |
| <b>⑤ Motor plugs</b><br>Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e, incl. star jumper, incl. gland <ul style="list-style-type: none"> <li>• 7 female contacts 1.5 mm<sup>2</sup></li> <li>• 7 female contacts 2.5 mm<sup>2</sup></li> </ul>                                                                                   | <b>3RK1 911-2BM21</b><br><b>3RK1 911-2BM22</b>                          |
| <b>⑥ Motor plugs with EMC suppressor circuit</b><br>Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e with EMC suppressor circuit, incl. star jumper, incl. gland <ul style="list-style-type: none"> <li>• 7 female contacts 1.5 mm<sup>2</sup></li> <li>• 7 female contacts 2.5 mm<sup>2</sup></li> </ul>                           | <b>3RK1 911-2BL21</b><br><b>3RK1 911-2BL22</b>                          |
| <b>⑦ Power loop-through plugs</b><br>Connector set for power loop-through for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angled outgoing feeder, pin insert for HAN Q4/2, incl. gland <ul style="list-style-type: none"> <li>• 4 male contacts 2.5 mm<sup>2</sup></li> <li>• 4 male contacts 4 mm<sup>2</sup></li> </ul>                                               | <b>3RK1 911-2BF50</b><br><b>3RK1 911-2BF10</b>                          |
| <b>⑧ Power connection cables, assembled at one end</b><br>Power connection cable for ET 200pro motor starters, ECOFAST, open at one end, for HAN Q4/2, angled, insert turned at isolator module end, 4 x 4 mm <sup>2</sup> <ul style="list-style-type: none"> <li>• Length 1.5 m</li> <li>• Length 5.0 m</li> </ul>                                                                                                                   | <b>3RK1 911-0DB13</b><br><b>3RK1 911-0DB33</b>                          |
| <b>⑨ Power connection cables for isolator modules, assembled at one end</b><br>Power connection cable for ET 200pro isolator modules, open at one end, for HAN Q4/2, angled, insert turned at isolator module end, 4 x 4 mm <sup>2</sup> <ul style="list-style-type: none"> <li>• Length 1.5 m</li> <li>• Length 5.0 m</li> </ul>                                                                                                     | <b>3RK1 911-0DF13</b><br><b>3RK1 911-0DF33</b>                          |

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# SIMATIC ET 200 distributed I/O

## ET 200pro

### Accessories for ET 200pro motor starters

| Version                                                                                                                                                                                                                                                                                                                            | Order No.                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| <b>⑩ Motor cables, assembled at one end</b><br>Open at one end, HAN Q8, angled, length 5 m <ul style="list-style-type: none"> <li>• Motor cable for motor without brake, for ET 200pro, ET 200X, AS-i Compact, 4 x 1.5 mm<sup>2</sup></li> <li>• Motor cable for motor with brake, for ET 200pro, 6 x 1.5mm<sup>2</sup></li> </ul> | <b>3RK1 911-0EB31</b><br><br><b>3RK1 911-0ED31</b> |

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technology"

| Version                                                                                                                                                                                  | Order No.                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <b>Module racks, wide<sup>1)</sup></b> <ul style="list-style-type: none"> <li>• Length 500 mm</li> <li>• Length 1000 mm</li> <li>• Length 2000 mm</li> </ul>                             | <b>6ES7 194-4GB00-0AA0</b><br><b>6ES7 194-4GB60-0AA0</b><br><b>6ES7 194-4GB20-0AA0</b> |
| <b>Module racks, wide, compact<sup>1)</sup></b> <ul style="list-style-type: none"> <li>• Length 500 mm</li> <li>• Length 1000 mm</li> <li>• Length 2000 mm</li> </ul>                    | <b>6ES7 194-4GD00-0AA0</b><br><b>6ES7 194-4GD10-0AA0</b><br><b>6ES7 194-4GD20-0AA0</b> |
| <b>Backplane bus modules 110 mm<sup>2)</sup></b>                                                                                                                                         | <b>3RK1 922-2BA00</b>                                                                  |
| <b>Backplane bus modules for Safety local isolator modules</b>                                                                                                                           | <b>3RK1 922-2BA01</b>                                                                  |
| <b>RS 232 interface cables</b>                                                                                                                                                           | <b>3RK1 922-2BP00</b>                                                                  |
| <b>Hand-held devices</b><br>for ET 200pro motor starter,<br>(also for ET 200S High-Feature and ECOFAST),<br>for local operation.<br>A serial interface cable must be ordered separately. | <b>3RK1 922-3BA00</b>                                                                  |
| <b>Sealing caps (for power supply)</b><br>(1 pack contains 10 units)                                                                                                                     | <b>3RK1 902-0CJ00</b>                                                                  |
| <b>Dismantling tools for HAN Q4/2</b>                                                                                                                                                    | <b>3RK1 902-0AB00</b>                                                                  |
| <b>Crimping tools for pins/sockets 4 mm<sup>2</sup> and 6 mm<sup>2</sup></b>                                                                                                             | <b>3RK1 902-0CW00</b>                                                                  |
| <b>Crimping tools for male contacts and sockets up to 4.0 mm<sup>2</sup> (HAN Q8/0)</b>                                                                                                  | <b>3RK1 902-0CT00</b>                                                                  |
| <b>Dismantling tools for male contacts and sockets (HAN Q8/0)</b>                                                                                                                        | <b>3RK1 902-0AJ00</b>                                                                  |
| <b>M12 sealing caps</b><br>For sealing unused input<br>and output sockets<br>(one set contains ten sealing caps)                                                                         | <b>3RX9 802-0AA00</b>                                                                  |

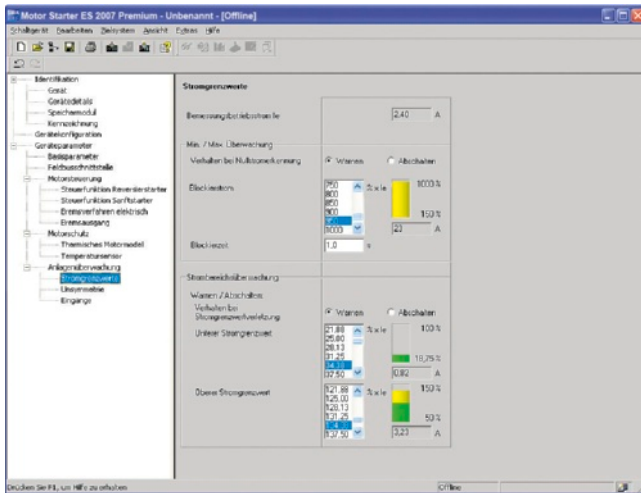


3RK1 922-3BA00

<sup>1)</sup> The wide module rack can accommodate all ET 200pro motor starters and any optional modules (isolator module, Safety local isolator module and 400 V disconnecting module).

<sup>2)</sup> The backplane bus module is a prerequisite for operation of the motor starter ET 200pro and the optional module.

## Overview



Motor starter ES for parameterization, monitoring, diagnostics and testing of motor starters

Motor starter ES is used for start-up, parameterization, diagnostics, documentation and the preventative maintenance of the motor starters in the SIMATIC ET 200pro, SIMATIC ET 200S, ECOFAST and SIRIUS M200D product families.

Note:

For further information see page 9/180.

# SIMATIC ET 200 distributed I/O

## ET 200eco PN

### ET 200eco PN

#### Overview



- Compact block I/O for processing digital, analog and IO-Link signals for connection to the PROFINET bus system
- Cabinet-free design with degree of protection IP65/66/67 with M12 connections
- Very rugged and resistant metal enclosure and encapsulated
- Compact module in two types of enclosures:
  - 30 mm x 200 mm x 37 mm (W x H x D, long and narrow enclosure), with 4 x M12 for digital signals
  - 60 mm x 175 mm x 37 mm (W x H x D, short and wide enclosure), with 8 x M12 for digital signals and IO-Link
  - 60 mm x 175 mm x 37 mm (W x H x D, short and wide enclosure) with 4 x M12 or 8 x M12 for analog signals
- PROFINET connection: 2 x M12 and automatic PROFINET address assignment
- Data transmission rate 100 Mbit/s
- LLDP proximity detection without PG and Fast Startup (boot up within approx 0.5 seconds)
- Supply and load voltage connection: 2 x M12
- Module variance:
  - 8 DI
  - 16 DI
  - 8 DO (2 A)
  - 8 DO (1.3 A)
  - 8 DO (0.5 A)
  - 16 DO (1.3 A)
  - 8 DI/DO (1.3 A),
  - 8 AI (U, I, TC, RTD)
  - 4 AO (U, I)
  - 4 IO-Link + 8 DI + 4 DO (1.3 A)
- Channel-specific diagnostics

#### Technical specifications

|                                                        | 6ES7 141-6BF00-0AB0 | 6ES7 141-6BG00-0AB0 | 6ES7 141-6BH00-0AB0 |
|--------------------------------------------------------|---------------------|---------------------|---------------------|
| <b>General information</b>                             |                     |                     |                     |
| Vendor identification (VendorID)                       | 002AH               | 002AH               | 002AH               |
| Device identifier (DeviceID)                           | 0306H               | 0306H               | 0306H               |
| • 24 V DC                                              | Yes                 | Yes                 | Yes                 |
| • permissible range, lower limit (DC)                  | 20.4 V              | 20.4 V              | 20.4 V              |
| • permissible range, upper limit (DC)                  | 28.8 V              | 28.8 V              | 28.8 V              |
| • reverse polarity protection                          | Yes                 | Yes                 | Yes                 |
| Current consumption, typ.                              | 100 mA              | 100 mA              | 100 mA              |
| <b>Encoder supply</b>                                  |                     |                     |                     |
| Number of outputs                                      | 4                   | 8                   | 8                   |
| Output current, rated value                            | 100 mA; per output  | 100 mA; per output  | 100 mA; per output  |
| 24 V encoder supply                                    |                     |                     |                     |
| • Short-circuit protection                             | Yes                 | Yes                 | Yes                 |
| <b>Power losses</b>                                    |                     |                     |                     |
| Power loss, typ.                                       | 5.5 W               | 4.5 W               | 6.5 W               |
| <b>Digital inputs</b>                                  |                     |                     |                     |
| Number of digital inputs                               | 8                   | 8                   | 16                  |
| • in groups of                                         | 2                   | 1                   | 2                   |
| Number of simultaneously control-<br>lable inputs      |                     |                     |                     |
| • all mounting positions                               |                     |                     |                     |
| - Concurrently controllable inputs,<br>up to 60 °C     | 8                   | 8                   | 16                  |
| Input characteristic curve acc. to IEC<br>1131, Type 3 | Yes                 | Yes                 | Yes                 |
| Input voltage                                          |                     |                     |                     |
| • Rated value, DC                                      | 24 V                | 24 V                | 24 V                |
| • for signal "0"                                       | -3 to +5 V          | -3 to +5 V          | -3 to +5 V          |
| • for signal "1"                                       | 11 to 30 V          | 11 to 30 V          | 11 to 30 V          |

**Technical specifications** (continued)

|                                                            | 6ES7 141-6BF00-0AB0         | 6ES7 141-6BG00-0AB0         | 6ES7 141-6BH00-0AB0         |
|------------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|
| Input current                                              |                             |                             |                             |
| • for signal "0", max.<br>(permissible quiescent current)  | 1.5 mA                      | 1.5 mA                      | 1.5 mA                      |
| • for signal "1", typ.                                     | 7 mA                        | 7 mA                        | 7 mA                        |
| Input delay<br>(for rated value of input voltage)          |                             |                             |                             |
| • for standard inputs                                      |                             |                             |                             |
| - at "0" to "1", max.                                      | Typ. 3 ms                   | Typ. 3 ms                   | Typ. 3 ms                   |
| - at "1" to "0", max.                                      | Typ. 3 ms                   | Typ. 3 ms                   | Typ. 3 ms                   |
| Cable length                                               |                             |                             |                             |
| • Cable length unshielded, max.                            | 30 m                        | 30 m                        | 30 m                        |
| <b>Interfaces</b>                                          |                             |                             |                             |
| Transmission procedure                                     | 100BASE-TX                  | 100BASE-TX                  | 100BASE-TX                  |
| Transmission rate, max.                                    | 100 Mbit/s                  | 100 Mbit/s                  | 100 Mbit/s                  |
| • Number of PROFINET interfaces                            | 2                           | 2                           | 2                           |
| • Autocrossing                                             | Yes                         | Yes                         | Yes                         |
| • Automatic detection of<br>transmission speed             | Yes                         | Yes                         | Yes                         |
| • Integrated switch                                        | Yes                         | Yes                         | Yes                         |
| • PROFINET IO device                                       |                             |                             |                             |
| - IRT with the option<br>"high flexibility" supported      | Yes                         | Yes                         | Yes                         |
| - Prioritized startup supported                            | Yes                         | Yes                         | Yes                         |
| <b>Protocols</b>                                           |                             |                             |                             |
| PROFINET IO                                                | Yes                         | Yes                         | Yes                         |
| Protocols (Ethernet)                                       |                             |                             |                             |
| • SNMP                                                     | Yes                         | Yes                         | Yes                         |
| • DCP                                                      | Yes                         | Yes                         | Yes                         |
| • LLDP                                                     | Yes                         | Yes                         | Yes                         |
| • ping                                                     | Yes                         | Yes                         | Yes                         |
| • arp                                                      | Yes                         | Yes                         | Yes                         |
| <b>Alarms/diagnostics/status<br/>information</b>           |                             |                             |                             |
| Status indicator                                           | Yes; green LED              | Yes; green LED              | Yes; green LED              |
| Alarms                                                     |                             |                             |                             |
| • Diagnostic alarm                                         | Yes                         | Yes                         | Yes                         |
| Diagnostics                                                |                             |                             |                             |
| • Diagnostic functions                                     | Yes                         | Yes                         | Yes                         |
| • Diagnostic information readable                          | Yes                         | Yes                         | Yes                         |
| • Monitoring the supply voltage to<br>the electronics      | Yes; green "ON" LED         | Yes; green "ON" LED         | Yes; green "ON" LED         |
| • Wire break in signal transmitter<br>cable                | Yes                         | Yes                         | Yes                         |
| • Short circuit encoder supply                             | Yes; per channel group      | Yes; per channel group      | Yes; per channel group      |
| • Group error                                              | Yes; red/yellow "SF/MT" LED | Yes; red/yellow "SF/MT" LED | Yes; red/yellow "SF/MT" LED |
| <b>Galvanic isolation</b>                                  |                             |                             |                             |
| between the load voltages                                  | Yes                         | Yes                         | Yes                         |
| between load voltage and all other<br>switching components | No                          | No                          | No                          |
| between Ethernet and electronics                           | Yes                         | Yes                         | Yes                         |
| Galvanic isolation digital inputs                          |                             |                             |                             |
| • between the channels                                     | No                          | No                          | No                          |
| <b>Permissible potential difference</b>                    |                             |                             |                             |
| between different circuits                                 | 75 V DC/60 V AC             | 75 V DC/60 V AC             | 75 V DC/60 V AC             |

# SIMATIC ET 200 distributed I/O

## ET 200eco PN

### ET 200eco PN

#### Technical specifications (continued)

|                              | 6ES7 141-6BF00-0AB0              | 6ES7 141-6BG00-0AB0              | 6ES7 141-6BH00-0AB0              |
|------------------------------|----------------------------------|----------------------------------|----------------------------------|
| <b>Isolation</b>             |                                  |                                  |                                  |
| tested with                  |                                  |                                  |                                  |
| • 24 V DC circuits           | 500 V                            | 500 V                            | 500 V                            |
| • Interface                  | 1 500 V; according to IEEE 802.3 | 1 500 V; according to IEEE 802.3 | 1 500 V; according to IEEE 802.3 |
| IP65                         | Yes                              | Yes                              | Yes                              |
| IP66                         | Yes                              | Yes                              | Yes                              |
| IP67                         | Yes                              | Yes                              | Yes                              |
| <b>Connection method</b>     |                                  |                                  |                                  |
| M12                          | Yes                              | Yes                              | Yes                              |
| <b>Dimensions and weight</b> |                                  |                                  |                                  |
| Dimensions                   |                                  |                                  |                                  |
| • Width                      | 30 mm                            | 60 mm                            | 60 mm                            |
| • Height                     | 200 mm                           | 175 mm                           | 175 mm                           |
| • Depth                      | 49 mm                            | 49 mm                            | 49 mm                            |
| Weight                       |                                  |                                  |                                  |
| • Weight                     | 550 g                            | 910 g                            | 910 g                            |

## Technical specifications (continued)

|                                             | 6ES7 142-6BF50-0AB0   | 6ES7 142-6BF00-0AB0   | 6ES7 142-6BG00-0AB0   | 6ES7 142-6BR00-0AB0   | 6ES7 142-6BH00-0AB0   |
|---------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <b>General information</b>                  |                       |                       |                       |                       |                       |
| Vendor identification (VendorID)            | 002AH                 | 002AH                 | 002AH                 | 002AH                 | 002AH                 |
| Device identifier (DeviceID)                | 0306H                 | 0306H                 | 0306H                 | 0306H                 | 0306H                 |
| Load voltage 1L+                            |                       |                       |                       |                       |                       |
| • Rated value (DC)                          | 24 V                  | 24 V                  | 24 V                  | 24 V                  | 24 V                  |
| • Permissible range, lower limit (DC)       | 20.4 V                | 20.4 V                | 20.4 V                | 20.4 V                | 20.4 V                |
| • Permissible range, upper limit (DC)       | 28.8 V                | 28.8 V                | 28.8 V                | 28.8 V                | 28.8 V                |
| • Reverse polarity protection               | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |
| Load voltage 2L+                            |                       |                       |                       |                       |                       |
| • Rated value (DC)                          | 24 V                  | 24 V                  | 24 V                  | 24 V                  | 24 V                  |
| • Permissible range, lower limit (DC)       | 20.4 V                | 20.4 V                | 20.4 V                | 20.4 V                | 20.4 V                |
| • Permissible range, upper limit (DC)       | 28.8 V                | 28.8 V                | 28.8 V                | 28.8 V                | 28.8 V                |
| • Reverse polarity protection               | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |
| from load voltage 1L+ (unswitched voltage)  | 100 mA                | 4 A                   | 4 A                   | 4 A                   | 4 A                   |
| from load voltage 2L+, max.                 | 4 A                   | 4 A                   | 4 A                   | 4 A                   | 4 A                   |
| <b>Power losses</b>                         |                       |                       |                       |                       |                       |
| Power loss, typ.                            | 3 W                   | 5.5 W                 | 5.5 W                 | 5 W                   | 5.5 W                 |
| <b>Digital outputs</b>                      |                       |                       |                       |                       |                       |
| Number of digital outputs                   | 8                     | 8                     | 8                     | 8                     | 16                    |
| • in groups of                              | 8                     | 4                     | 4                     | 4                     | 8                     |
| Short-circuit protection                    | Yes; electronic       | Yes; electronic       | Yes; electronic       | Yes; electronic       | Yes; electronic       |
| • Response threshold, typ.                  | 0.7 A                 | 1.8 A                 | 1.8 A                 | 2.8 A                 | 1.8 A                 |
| Limitation of inductive shutdown voltage to | Typ. (L1+, L2+) -47 V | Typ. (L1+, L2+) -47 V | Typ. (L1+, L2+) -47 V | Typ. (L1+, L2+) -47 V | Typ. (L1+, L2+) -47 V |
| Switching capacity of the outputs           |                       |                       |                       |                       |                       |
| • on lamp load, max.                        | 5 W                   | 5 W                   | 5 W                   | 10 W                  | 5 W                   |
| Controlling a digital input                 | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |
| Output current                              |                       |                       |                       |                       |                       |
| • for signal "1" rated value                | 0.5 A                 | 1.3 A; maximum        | 1.3 A; maximum        | 2 A                   | 1.3 A; maximum        |
| • for signal "0" residual current, max.     | 1.5 mA                | 1.5 mA                | 1.5 mA                | 1.5 mA                | 1.5 mA                |
| Parallel switching of 2 outputs             |                       |                       |                       |                       |                       |
| • for increased power                       | No                    | No                    | No                    | No                    | No                    |
| • for redundant control of a load           | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |
| Switching frequency                         |                       |                       |                       |                       |                       |
| • with resistive load, max.                 | 100 Hz                | 100 Hz                | 100 Hz                | 100 Hz                | 100 Hz                |
| • with inductive load, max.                 | 0.5 Hz                | 0.5 Hz                | 0.5 Hz                | 0.5 Hz                | 0.5 Hz                |
| • on lamp load, max.                        | 1 Hz                  | 1 Hz                  | 1 Hz                  | 1 Hz                  | 1 Hz                  |
| Aggregate current of outputs (per group)    |                       |                       |                       |                       |                       |
| • up to 55 °C, max.                         | 4 A                   | 3.9 A                 | 3.9 A                 | 3.9 A                 | 3.9 A                 |
| • up to 60 °C, max.                         |                       | 2.6 A                 |                       |                       |                       |
| Cable length                                |                       |                       |                       |                       |                       |
| • Cable length unshielded, max.             | 30 m                  | 30 m                  | 30 m                  | 30 m                  | 30 m                  |

# SIMATIC ET 200 distributed I/O

## ET 200eco PN

### ET 200eco PN

#### Technical specifications (continued)

|                                                         | 6ES7 142-6BF50-0AB0         | 6ES7 142-6BF00-0AB0         | 6ES7 142-6BG00-0AB0         | 6ES7 142-6BR00-0AB0         | 6ES7 142-6BH00-0AB0         |
|---------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| <b>Interfaces</b>                                       |                             |                             |                             |                             |                             |
| Transmission procedure                                  | 100BASE-TX                  | 100BASE-TX                  | 100BASE-TX                  | 100BASE-TX                  | 100BASE-TX                  |
| Transmission rate, max.                                 | 100 Mbit/s                  | 100 Mbit/s                  | 100 Mbit/s                  | 100 Mbit/s                  | 100 Mbit/s                  |
| • Number of PROFINET interfaces                         | 2                           | 2                           | 2                           | 2                           | 2                           |
| • Autocrossing                                          | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| • Automatic detection of transmission speed             | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| • Integrated switch                                     | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| • PROFINET IO device                                    | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| - IRT with the option "high flexibility" supported      | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| - Prioritized startup supported                         | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| <b>Protocols</b>                                        |                             |                             |                             |                             |                             |
| PROFINET IO                                             | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| Protocols (Ethernet)                                    |                             |                             |                             |                             |                             |
| • SNMP                                                  | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| • DCP                                                   | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| • LLDP                                                  | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| • ping                                                  | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| • arp                                                   | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| <b>Alarms/diagnostics/status information</b>            |                             |                             |                             |                             |                             |
| Status indicator                                        | Yes; green LED              | Yes; green LED              | Yes; green LED              | Yes; green LED              | Yes; green LED              |
| <b>Alarms</b>                                           |                             |                             |                             |                             |                             |
| • Diagnostic alarm                                      | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| <b>Diagnostics</b>                                      |                             |                             |                             |                             |                             |
| • Diagnostic functions                                  | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| • Diagnostic information readable                       | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| • Monitoring the supply voltage to the electronics      | Yes; green "ON" LED         | Yes; green "ON" LED         | Yes; green "ON" LED         | Yes; green "ON" LED         | Yes; green "ON" LED         |
| • Wire break in actuator cable                          | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| • Short circuit                                         | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| • Group error                                           | Yes; red/yellow "SF/MT" LED | Yes; red/yellow "SF/MT" LED | Yes; red/yellow "SF/MT" LED | Yes; red/yellow "SF/MT" LED | Yes; red/yellow "SF/MT" LED |
| <b>Galvanic isolation</b>                               |                             |                             |                             |                             |                             |
| between the load voltages                               | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| between load voltage and all other switching components | No                          | No                          | No                          | No                          | No                          |
| between Ethernet and electronics                        | Yes                         | Yes                         | Yes                         | Yes                         | Yes                         |
| <b>Galvanic isolation digital outputs</b>               |                             |                             |                             |                             |                             |
| • between the channels                                  | No                          | No                          | No                          | No                          | No                          |
| <b>Permissible potential difference</b>                 |                             |                             |                             |                             |                             |
| between different circuits                              | 75 V DC/60 V AC             | 75 V DC/60 V AC             | 75 V DC/60 V AC             | 75 V DC/60 V AC             | 75 V DC/60 V AC             |

## Technical specifications (continued)

|                                                                              | 6ES7 142-6BF50-0AB0                       | 6ES7 142-6BF00-0AB0                       | 6ES7 142-6BG00-0AB0                       | 6ES7 142-6BR00-0AB0                       | 6ES7 142-6BH00-0AB0                       |
|------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|
| <b>Isolation</b><br>tested with<br>• 24 V DC circuits<br>• Interface         | 500 V<br>1 500 V; according to IEEE 802.3 | 500 V<br>1 500 V; according to IEEE 802.3 | 500 V<br>1 500 V; according to IEEE 802.3 | 500 V<br>1 500 V; according to IEEE 802.3 | 500 V<br>1 500 V; according to IEEE 802.3 |
| IP65                                                                         | Yes                                       | Yes                                       | Yes                                       | Yes                                       | Yes                                       |
| IP66                                                                         | Yes                                       | Yes                                       | Yes                                       | Yes                                       | Yes                                       |
| IP67                                                                         | Yes                                       | Yes                                       | Yes                                       | Yes                                       | Yes                                       |
| <b>Connection method</b><br>M12                                              | Yes                                       | Yes                                       | Yes                                       | Yes                                       | Yes                                       |
| <b>Dimensions and weight</b><br>Dimensions<br>• Width<br>• Height<br>• Depth | 30 mm<br>200 mm<br>49 mm                  | 30 mm<br>200 mm<br>49 mm                  | 60 mm<br>175 mm<br>49 mm                  | 60 mm<br>175 mm<br>49 mm                  | 60 mm<br>175 mm<br>49 mm                  |
| Weight<br>• Weight                                                           | 550 g                                     | 550 g                                     | 910 g                                     | 910 g                                     | 910 g                                     |

| 6ES7 147-6BG00-0AB0                               |                    |
|---------------------------------------------------|--------------------|
| <b>General information</b>                        |                    |
| Vendor identification (VendorID)                  | 002AH              |
| Device identifier (DeviceID)                      | 0306H              |
| • 24 V DC                                         | Yes                |
| • Permissible range, lower limit (DC)             | 20.4 V             |
| • Permissible range, upper limit (DC)             | 28.8 V             |
| • Reverse polarity protection                     | Yes                |
| Load voltage 2L+                                  |                    |
| • Rated value (DC)                                | 24 V               |
| • Permissible range, lower limit (DC)             | 20.4 V             |
| • Permissible range, upper limit (DC)             | 28.8 V             |
| • Reverse polarity protection                     | Yes                |
| from load voltage 1L+ (unswitched voltage)        | 4 A                |
| from load voltage 2L+, max.                       | 4 A                |
| <b>Encoder supply</b>                             |                    |
| Number of outputs                                 | 8                  |
| Output current, rated value                       | 100 mA; Per output |
| 24 V encoder supply<br>• Short-circuit protection | Yes                |

| 6ES7 147-6BG00-0AB0                                                            |                        |
|--------------------------------------------------------------------------------|------------------------|
| <b>Power losses</b>                                                            |                        |
| Power loss, typ.                                                               | 6.5 W                  |
| <b>Digital inputs</b>                                                          |                        |
| Number of digital inputs                                                       | 8                      |
| • in groups of                                                                 | 4                      |
| Number of simultaneously control-<br>lable inputs                              |                        |
| • all mounting positions<br>- Concurrently controllable inputs,<br>up to 60 °C | 8                      |
| Input characteristic curve acc. to<br>IEC 1131, Type 3                         | Yes                    |
| Input voltage                                                                  |                        |
| • Rated value, DC                                                              | 24 V                   |
| • for signal "0"                                                               | -3 to +5 V             |
| • for signal "1"                                                               | 11 to 30 V             |
| Input current                                                                  |                        |
| • for signal "0", max. (permissible<br>quiescent current)                      | 1.5 mA                 |
| • for signal "1", typ.                                                         | 7 mA                   |
| Input delay (for rated value of input<br>voltage)                              |                        |
| • for standard inputs<br>- at "0" to "1", max.<br>- at "1" to "0", max.        | Typ. 3 ms<br>Typ. 3 ms |
| Cable length                                                                   |                        |
| • Cable length unshielded, max.                                                | 30 m                   |



# SIMATIC ET 200 distributed I/O

## ET 200eco PN

### ET 200eco PN

#### Technical specifications (continued)

| 6ES7 147-6BG00-0AB0                                |                       |
|----------------------------------------------------|-----------------------|
| <b>Digital outputs</b>                             |                       |
| Number of digital outputs                          | 8                     |
| • in groups of                                     | 4                     |
| Short-circuit protection                           | Yes; Electronic       |
| • Response threshold, typ.                         | 1.8 A                 |
| Limitation of inductive shutdown voltage to        | Typ. (L1+, L2+) -47 V |
| Switching capacity of the outputs                  |                       |
| • on lamp load, max.                               | 5 W                   |
| Controlling a digital input                        | Yes                   |
| Output current                                     |                       |
| • for signal "1" rated value                       | 1.3 A; maximum        |
| • for signal "0" residual current, max.            | 1.5 mA                |
| Parallel switching of 2 outputs                    |                       |
| • for increased power                              | No                    |
| • for redundant control of a load                  | Yes                   |
| Switching frequency                                |                       |
| • with resistive load, max.                        | 100 Hz                |
| • with inductive load, max.                        | 0.5 Hz                |
| • on lamp load, max.                               | 1 Hz                  |
| Aggregate current of outputs (per group)           |                       |
| • up to 60 °C, max.                                | 3.9 A                 |
| Cable length                                       |                       |
| • Cable length unshielded, max.                    | 30 m                  |
| <b>Interfaces</b>                                  |                       |
| Transmission procedure                             | 100BASE-TX            |
| Transmission rate, max.                            | 100 Mbit/s            |
| • Number of PROFINET interfaces                    | 2                     |
| • Autocrossing                                     | Yes                   |
| • Automatic detection of transmission speed        | Yes                   |
| • Integrated switch                                | Yes                   |
| • PROFINET IO device                               |                       |
| - IRT with the option "high flexibility" supported | Yes                   |
| - Prioritized startup supported                    | Yes                   |
| <b>Protocols</b>                                   |                       |
| PROFINET IO                                        | Yes                   |
| Protocols (Ethernet)                               |                       |
| • SNMP                                             | Yes                   |
| • DCP                                              | Yes                   |
| • LLDP                                             | Yes                   |
| • ping                                             | Yes                   |
| • arp                                              | Yes                   |

| 6ES7 147-6BG00-0AB0                                     |                                  |
|---------------------------------------------------------|----------------------------------|
| <b>Alarms/diagnostics/status information</b>            |                                  |
| Status indicator                                        | Yes; Green LED                   |
| Alarms                                                  |                                  |
| • Diagnostic alarm                                      | Yes                              |
| Diagnostics                                             |                                  |
| • Diagnostic functions                                  | Yes                              |
| • Diagnostic information readable                       | Yes                              |
| • Monitoring the supply voltage to the electronics      | Yes; Green "ON" LED              |
| • Wire break in actuator cable                          | Yes                              |
| • Wire break in signal transmitter cable                | Yes                              |
| • Short circuit                                         | Yes                              |
| • Short circuit encoder supply                          | Yes                              |
| • Group error                                           | Yes; Red/yellow "SF/MT" LED      |
| <b>Galvanic isolation</b>                               |                                  |
| between the load voltages                               | Yes                              |
| between load voltage and all other switching components | No                               |
| between Ethernet and electronics                        | Yes                              |
| Galvanic isolation digital inputs                       |                                  |
| • between the channels                                  | No                               |
| Galvanic isolation digital outputs                      |                                  |
| • between the channels                                  | No                               |
| <b>Permissible potential difference</b>                 |                                  |
| between different circuits                              | 75 V DC / 60 V AC                |
| <b>Isolation</b>                                        |                                  |
| tested with                                             |                                  |
| • 24 V DC circuits                                      | 500 V                            |
| • Interface                                             | 1 500 V; According to IEEE 802.3 |
| IP65                                                    | Yes                              |
| IP66                                                    | Yes                              |
| IP67                                                    | Yes                              |
| <b>Connection method</b>                                |                                  |
| M12                                                     | Yes                              |
| <b>Dimensions and weight</b>                            |                                  |
| Dimensions                                              |                                  |
| • Width                                                 | 60 mm                            |
| • Height                                                | 175 mm                           |
| • Depth                                                 | 49 mm                            |
| Weight                                                  |                                  |
| • Weight                                                | 910 g                            |

## Technical specifications (continued)

| 6ES7 144-6KD00-0AB0                                                   |                                        |
|-----------------------------------------------------------------------|----------------------------------------|
| <b>General information</b>                                            |                                        |
| Vendor identification (VendorID)                                      | 002AH                                  |
| Device identifier (DeviceID)                                          | 0306H                                  |
| • 24 V DC                                                             | Yes                                    |
| • Permissible range, lower limit (DC)                                 | 20.4 V                                 |
| • Permissible range, upper limit (DC)                                 | 28.8 V                                 |
| • Reverse polarity protection                                         | Yes                                    |
| Current consumption, typ.                                             | 110 mA                                 |
| <b>Encoder supply</b>                                                 |                                        |
| Number of outputs                                                     | 4                                      |
| 24 V encoder supply                                                   |                                        |
| • Short-circuit protection                                            | Yes; electronic at 1.4 A               |
| • Output current, max.                                                | 1 A                                    |
| <b>Power losses</b>                                                   |                                        |
| Power loss, typ.                                                      | 2.8 W                                  |
| <b>Analog inputs</b>                                                  |                                        |
| Number of analog inputs                                               | 8                                      |
| Number of analog inputs for voltage/current measurement               | 4                                      |
| Number of analog inputs for resistance/temperature measurement        | 4                                      |
| Cable length, shielded, max.                                          | 30 m                                   |
| Permissible input voltage for voltage input (destruction limit), max. | 28.8 V permanent, 35 V for max. 500 ms |
| Input ranges (rated values), voltages                                 |                                        |
| • 0 to +10 V                                                          | Yes                                    |
| • 1 to 5 V                                                            | Yes                                    |
| • -10 V to +10 V                                                      | Yes                                    |
| • -80 mV to +80 mV                                                    | Yes                                    |
| Input ranges (rated values), currents                                 |                                        |
| • 0 to 20 mA                                                          | Yes                                    |
| • -20 to +20 mA                                                       | Yes                                    |
| • 4 to 20 mA                                                          | Yes                                    |
| Input ranges (rated values), thermoelements                           |                                        |
| • Type E                                                              | Yes                                    |
| • Type J                                                              | Yes                                    |
| • Type K                                                              | Yes                                    |
| • Type N                                                              | Yes                                    |
| Input ranges (rated values), resistance thermometers                  |                                        |
| • Ni 100                                                              | Yes                                    |
| • Ni 1000                                                             | Yes                                    |
| • Ni 120                                                              | Yes                                    |
| • Ni 200                                                              | Yes                                    |
| • Ni 500                                                              | Yes                                    |
| • Pt 100                                                              | Yes                                    |
| • Pt 1000                                                             | Yes                                    |
| • Pt 200                                                              | Yes                                    |
| • Pt 500                                                              | Yes                                    |
| Input ranges (rated values), resistors                                |                                        |
| • 0 to 150 Ohm                                                        | Yes                                    |
| • 0 to 300 Ohm                                                        | Yes                                    |
| • 0 to 600 Ohm                                                        | Yes                                    |
| • 0 to 3000 Ohm                                                       | Yes                                    |

| 6ES7 144-6KD00-0AB0                                                                        |                                                              |
|--------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Temperature compensation                                                                   |                                                              |
| • Temperature compensation parameterizable                                                 | Yes                                                          |
| • Internal temperature compensation                                                        | Yes                                                          |
| • External temperature compensation with compensations socket                              | Yes                                                          |
| <b>Analog value creation</b>                                                               |                                                              |
| Analog value display                                                                       | SIMATIC S7 format                                            |
| Measurement principle                                                                      | Integrating                                                  |
| Integrations and conversion time/resolution per channel                                    |                                                              |
| • Resolution (incl. overrange)                                                             | 15 bit + sign                                                |
| • Integration time, parameterizable                                                        | Yes                                                          |
| • Integration time, ms                                                                     | 2/16.67/20/100 ms                                            |
| • Interference voltage suppression for interference frequency f1 in Hz                     | 500/50/60/10 Hz                                              |
| • Conversion time (per channel)                                                            | 4/19/22/102 ms                                               |
| Smoothing of measured values                                                               |                                                              |
| • parameterizable                                                                          | Yes                                                          |
| • Step: None                                                                               | Yes; 1 x cycle time                                          |
| • Step: Low                                                                                | Yes; 4 x cycle time                                          |
| • Step: Medium                                                                             | Yes; 16 x cycle time                                         |
| • Step: High                                                                               | Yes; 64 x cycle time                                         |
| <b>Encoder</b>                                                                             |                                                              |
| Number of connectable encoders, max.                                                       | 8                                                            |
| Connection of signal encoders                                                              |                                                              |
| • for voltage measurement                                                                  | Yes                                                          |
| • for current measurement as 2-wire transducer                                             | Yes                                                          |
| • for current measurement as 4-wire transducer                                             | Yes                                                          |
| • for resistance measurement with 2-conductor connection                                   | Yes                                                          |
| • for resistance measurement with 3-conductor connection                                   | Yes                                                          |
| • for resistance measurement with 4-conductor connection                                   | Yes                                                          |
| <b>Errors/accuracies</b>                                                                   |                                                              |
| Linearity error (relative to input area)                                                   | +/- 0.01 %                                                   |
| Temperature error (relative to input area)                                                 | U: 0.0035%/°C; I: 0.006%/°C; RTD: 0.0005%/°C; TC: 0.0035%/°C |
| Crosstalk between the inputs, min.                                                         | 85 dB                                                        |
| Repeat accuracy in settled status at 25 °C (relative to input area)                        | +/- 0.008 %                                                  |
| Interference voltage suppression for f = n x (f1 +/- 1%), f1 = interference frequency      |                                                              |
| • Series mode interference (peak value of interference < rated value of input range), min. | 46 dB                                                        |
| • Common mode interference, min.                                                           | 70 dB                                                        |

# SIMATIC ET 200 distributed I/O

## ET 200eco PN

### ET 200eco PN

#### Technical specifications (continued)

| 6ES7 144-6KD00-0AB0                                |                             |
|----------------------------------------------------|-----------------------------|
| <b>Interfaces</b>                                  |                             |
| Transmission procedure                             | 100BASE-TX                  |
| Transmission rate, max.                            | 100 Mbit/s                  |
| • Number of PROFINET interfaces                    | 2                           |
| • Autocrossing                                     | Yes                         |
| • Automatic detection of transmission speed        | Yes                         |
| • Integrated switch                                | Yes                         |
| • PROFINET IO device                               | Yes                         |
| - IRT with the option "high flexibility" supported | Yes                         |
| - Prioritized startup supported                    | Yes                         |
| <b>Protocols</b>                                   |                             |
| PROFINET IO                                        | Yes                         |
| <b>Protocols (Ethernet)</b>                        |                             |
| • SNMP                                             | Yes                         |
| • DCP                                              | Yes                         |
| • LLDP                                             | Yes                         |
| • ping                                             | Yes                         |
| • arp                                              | Yes                         |
| <b>Alarms/diagnostics/status information</b>       |                             |
| <b>Alarms</b>                                      |                             |
| • Diagnostic alarm                                 | Yes                         |
| <b>Diagnostics</b>                                 |                             |
| • Diagnostic functions                             | Yes                         |
| • Diagnostic information readable                  | Yes                         |
| • Monitoring the supply voltage to the electronics | Yes; Green "ON" LED         |
| • Short circuit encoder supply                     | Yes; Per module             |
| • Group error                                      | Yes; Red/yellow "SF/MT" LED |
| • Overflow/underflow                               | Yes                         |

| 6ES7 144-6KD00-0AB0                                     |                                  |
|---------------------------------------------------------|----------------------------------|
| <b>Galvanic isolation</b>                               |                                  |
| between the load voltages                               | Yes                              |
| between load voltage and all other switching components | No                               |
| between Ethernet and electronics                        | Yes                              |
| <b>Galvanic isolation analog inputs</b>                 |                                  |
| • between the channels                                  | No                               |
| <b>Permissible potential difference</b>                 |                                  |
| between inputs and MANA (UCM)                           | 10 Vpp AC                        |
| <b>Isolation</b>                                        |                                  |
| tested with                                             |                                  |
| • 24 V DC circuits                                      | 500 V                            |
| • Interface                                             | 1 500 V; According to IEEE 802.3 |
| IP65                                                    | Yes                              |
| IP66                                                    | Yes                              |
| IP67                                                    | Yes                              |
| <b>Connection method</b>                                |                                  |
| M12                                                     | Yes                              |
| <b>Dimensions and weight</b>                            |                                  |
| <b>Dimensions</b>                                       |                                  |
| • Width                                                 | 60 mm                            |
| • Height                                                | 175 mm                           |
| • Depth                                                 | 49 mm                            |
| <b>Weight</b>                                           |                                  |
| • Weight                                                | 930 g                            |

| 6ES7 145-6HD00-0AB0                         |                          |
|---------------------------------------------|--------------------------|
| <b>General information</b>                  |                          |
| Vendor identification (VendorID)            | 002AH                    |
| Device identifier (DeviceID)                | 0306H                    |
| • 24 V DC                                   | Yes                      |
| • Permissible range, lower limit (DC)       | 20.4 V                   |
| • Permissible range, upper limit (DC)       | 28.8 V                   |
| • Reverse polarity protection               | Yes                      |
| Current consumption, typ.                   | 280 mA                   |
| <b>Encoder supply</b>                       |                          |
| Number of outputs                           | 4                        |
| 24 V encoder supply                         |                          |
| • Short-circuit protection                  | Yes; Electronic at 1.4 A |
| • Output current, max.                      | 1 A                      |
| <b>Power losses</b>                         |                          |
| Power loss, typ.                            | 5.5 W                    |
| <b>Analog outputs</b>                       |                          |
| Number of analog outputs                    | 4                        |
| Cable length, shielded, max.                | 30 m                     |
| Voltage output, short-circuit protection    | Yes                      |
| Voltage output, short-circuit current, max. | 30 mA                    |

| 6ES7 145-6HD00-0AB0                                                        |                                        |
|----------------------------------------------------------------------------|----------------------------------------|
| Current output, no-load voltage, max.                                      | 20 V                                   |
| <b>Output ranges, voltage</b>                                              |                                        |
| • 0 to 10 V                                                                | Yes                                    |
| • 1 to 5 V                                                                 | Yes                                    |
| • -10 to +10 V                                                             | Yes                                    |
| <b>Output ranges, current</b>                                              |                                        |
| • 0 to 20 mA                                                               | Yes                                    |
| • -20 to +20 mA                                                            | Yes                                    |
| • 4 to 20 mA                                                               | Yes                                    |
| <b>Connection of actuators</b>                                             |                                        |
| • for voltage output 2-conductor connection                                | Yes                                    |
| • for current output 2-conductor connection                                | Yes                                    |
| <b>Load impedance (in rated range of output)</b>                           |                                        |
| • with voltage outputs, min.                                               | 1 kΩ                                   |
| • with voltage outputs, capacitive load, max.                              | 1 μF                                   |
| • with current outputs, max.                                               | 600 Ω                                  |
| • with current outputs, inductive load, max.                               | 1 mH                                   |
| <b>Destruction limits against externally applied voltages and currents</b> |                                        |
| • Voltages at the outputs towards MANA                                     | 28.8 V permanent, 35 V for max. 500 ms |

## Technical specifications (continued)

| 6ES7 145-6HD00-0AB0                                                                    |                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <b>Analog value creation</b>                                                           |                                                                |
| Analog value display                                                                   | SIMATIC S7 format                                              |
| Measurement principle                                                                  | Resistor network                                               |
| Integrations and conversion time/<br>resolution per channel                            |                                                                |
| • Resolution (incl. overrange)                                                         | 15 bit + sign                                                  |
| • Conversion time (per channel)                                                        | 1 ms                                                           |
| Settling time                                                                          |                                                                |
| • for resistive load                                                                   | 2 ms                                                           |
| • for capacitive load                                                                  | 1.8 ms                                                         |
| • for inductive load                                                                   | 2 ms                                                           |
| <b>Errors/accuracies</b>                                                               |                                                                |
| Output ripple (based on output<br>area, bandwidth 0 to 50 kHz)                         | U: $\pm 0.6$ mVrms; I: $\pm 0.4$ nArms                         |
| Linearity error (relative to output<br>area)                                           | $\pm 0.02$ %                                                   |
| Temperature error<br>(relative to output area)                                         | U: $0.001\%/^{\circ}\text{C}$ ; I: $0.0025\%/^{\circ}\text{C}$ |
| Crosstalk between the outputs, min.                                                    | 70 dB                                                          |
| Repeat accuracy in settled status<br>at $25^{\circ}\text{C}$ (relative to output area) | $\pm 0.008$ %                                                  |
| <b>Interfaces</b>                                                                      |                                                                |
| Transmission procedure                                                                 | 100BASE-TX                                                     |
| Transmission rate, max.                                                                | 100 Mbit/s                                                     |
| • Number of PROFINET interfaces                                                        | 2                                                              |
| • Autocrossing                                                                         | Yes                                                            |
| • Automatic detection of trans-<br>mission speed                                       | Yes                                                            |
| • Integrated switch                                                                    | Yes                                                            |
| • PROFINET IO device                                                                   |                                                                |
| - IRT with the option "high flexi-<br>bility" supported                                | Yes                                                            |
| - Prioritized startup supported                                                        | Yes                                                            |
| <b>Protocols</b>                                                                       |                                                                |
| PROFINET IO                                                                            | Yes                                                            |
| Protocols (Ethernet)                                                                   |                                                                |
| • SNMP                                                                                 | Yes                                                            |
| • DCP                                                                                  | Yes                                                            |
| • LLDP                                                                                 | Yes                                                            |
| • ping                                                                                 | Yes                                                            |
| • arp                                                                                  | Yes                                                            |

| 6ES7 145-6HD00-0AB0                                        |                                                |
|------------------------------------------------------------|------------------------------------------------|
| <b>Alarms/diagnostics/status infor-<br/>mation</b>         |                                                |
| Status indicator                                           | Yes                                            |
| Substitute values connectable                              | Yes                                            |
| Alarms                                                     |                                                |
| • Diagnostic alarm                                         | Yes                                            |
| Diagnostics                                                |                                                |
| • Diagnostic functions                                     | Yes                                            |
| • Diagnostic information readable                          | Yes                                            |
| • Monitoring the supply voltage to<br>the electronics      | Yes; Green "ON" LED                            |
| • Wire break                                               | Yes; Channel-by-channel with<br>current output |
| • Short circuit                                            | Yes; Channel-by-channel with<br>voltage output |
| • Group error                                              | Yes; Red/yellow "SF/MT" LED                    |
| <b>Galvanic isolation</b>                                  |                                                |
| between the load voltages                                  | Yes                                            |
| between load voltage and all other<br>switching components | No                                             |
| between Ethernet and electronics                           | Yes                                            |
| Galvanic isolation analog outputs                          |                                                |
| • between the channels                                     | No                                             |
| <b>Permissible potential difference</b>                    |                                                |
| between M internally and the<br>outputs                    | 10 Vpp AC                                      |
| IP65                                                       | Yes                                            |
| IP66                                                       | Yes                                            |
| IP67                                                       | Yes                                            |
| <b>Connection method</b>                                   |                                                |
| M12                                                        | Yes                                            |
| <b>Dimensions and weight</b>                               |                                                |
| Dimensions                                                 |                                                |
| • Width                                                    | 60 mm                                          |
| • Height                                                   | 175 mm                                         |
| • Depth                                                    | 49 mm                                          |
| Weight                                                     |                                                |
| • Weight                                                   | 930 g                                          |

# SIMATIC ET 200 distributed I/O

## ET 200eco PN

### ET 200eco PN

#### Technical specifications (continued)

| 6ES7 148-6JA00-0AB0                                    |                                    |
|--------------------------------------------------------|------------------------------------|
| <b>General information</b>                             |                                    |
| Vendor identification (VendorID)                       | 002AH                              |
| Device identifier (DeviceID)                           | 0306H                              |
| • 24 V DC                                              | Yes                                |
| • Permissible range, lower limit (DC)                  | 20.4 V                             |
| • Permissible range, upper limit (DC)                  | 28.8 V                             |
| • Reverse polarity protection                          | Yes                                |
| Load voltage 2L+                                       |                                    |
| • Rated value (DC)                                     | 24 V                               |
| • Permissible range, lower limit (DC)                  | 20.4 V                             |
| • Permissible range, upper limit (DC)                  | 28.8 V                             |
| • Reverse polarity protection                          | Yes                                |
| from load voltage 1L+ (unswitched voltage)             | 4 A                                |
| from load voltage 2L+, max.                            | 4 A                                |
| <b>Encoder supply</b>                                  |                                    |
| Number of outputs                                      | 6                                  |
| Output current, rated value                            | 200 mA; 100 mA per output to X5-X6 |
| 24 V encoder supply                                    |                                    |
| • Short-circuit protection                             | Yes                                |
| <b>Power losses</b>                                    |                                    |
| Power loss, typ.                                       | 8 W                                |
| <b>Digital inputs</b>                                  |                                    |
| Number of digital inputs                               | 8                                  |
| Number of simultaneously controllable inputs           |                                    |
| • all mounting positions                               |                                    |
| - Concurrently controllable inputs, up to 60 °C        | 8                                  |
| Input characteristic curve acc. to IEC 1131, Type 3    | Yes                                |
| Input voltage                                          |                                    |
| • Rated value, DC                                      | 24 V                               |
| • for signal "0"                                       | -3 to +5 V                         |
| • for signal "1"                                       | 11 to 30 V                         |
| Input current                                          |                                    |
| • for signal "0", max. (permissible quiescent current) | 1.5 mA                             |
| • for signal "1", typ.                                 | 7 mA                               |
| Input delay (for rated value of input voltage)         |                                    |
| • for standard inputs                                  |                                    |
| - at "0" to "1", max.                                  | Typ. 3 ms                          |
| - at "1" to "0", max.                                  | Typ. 3 ms                          |
| Cable length                                           |                                    |
| • Cable length unshielded, max.                        | 30 m                               |

| 6ES7 148-6JA00-0AB0                                |                       |
|----------------------------------------------------|-----------------------|
| <b>Digital outputs</b>                             |                       |
| Number of digital outputs                          | 4                     |
| Short-circuit protection                           | Yes; Electronic       |
| • Response threshold, typ.                         | 1.8 A                 |
| Limitation of inductive shutdown voltage to        | Typ. (L1+, L2+) -47 V |
| Switching capacity of the outputs                  |                       |
| • on lamp load, max.                               | 5 W                   |
| Controlling a digital input                        | Yes                   |
| Output current                                     |                       |
| • for signal "1" rated value                       | 1.3 A; maximum        |
| • for signal "0" residual current, max.            | 1.5 mA                |
| Parallel switching of 2 outputs                    |                       |
| • for increased power                              | No                    |
| • for redundant control of a load                  | Yes                   |
| Switching frequency                                |                       |
| • with resistive load, max.                        | 100 Hz                |
| • with inductive load, max.                        | 0.5 Hz                |
| • on lamp load, max.                               | 1 Hz                  |
| Aggregate current of outputs (per group)           |                       |
| • up to 60 °C, max.                                | 3.9 A                 |
| Cable length                                       |                       |
| • Cable length unshielded, max.                    | 30 m                  |
| <b>Interfaces</b>                                  |                       |
| Transmission procedure                             | 100BASE-TX            |
| Transmission rate, max.                            | 100 Mbit/s            |
| • Number of PROFINET interfaces                    | 2                     |
| • Autocrossing                                     | Yes                   |
| • Automatic detection of transmission speed        | Yes                   |
| • Integrated switch                                | Yes                   |
| • PROFINET IO device                               | Yes                   |
| - IRT with the option "high flexibility" supported | Yes                   |
| <b>Protocols</b>                                   |                       |
| PROFINET IO                                        | Yes                   |
| Protocols (Ethernet)                               |                       |
| • SNMP                                             | Yes                   |
| • DCP                                              | Yes                   |
| • LLDP                                             | Yes                   |
| • ping                                             | Yes                   |
| • arp                                              | Yes                   |

**Technical specifications** (continued)

| 6ES7 148-6JA00-0AB0                                     |                             |
|---------------------------------------------------------|-----------------------------|
| <b>Alarms/diagnostics/status information</b>            |                             |
| Status indicator                                        | Yes; Green LED              |
| <b>Alarms</b>                                           |                             |
| • Diagnostic alarm                                      | Yes                         |
| <b>Diagnostics</b>                                      |                             |
| • Diagnostic functions                                  | Yes                         |
| • Diagnostic information readable                       | Yes                         |
| • Monitoring the supply voltage to the electronics      | Yes; Green "ON" LED         |
| • Wire break in actuator cable                          | Yes                         |
| • Wire break in signal transmitter cable                | Yes                         |
| • Short circuit                                         | Yes                         |
| • Short circuit encoder supply                          | Yes                         |
| • Group error                                           | Yes; Red/yellow "SF/MT" LED |
| <b>Galvanic isolation</b>                               |                             |
| between the load voltages                               | Yes                         |
| between load voltage and all other switching components | No                          |
| between Ethernet and electronics                        | Yes                         |
| <b>Galvanic isolation digital inputs</b>                |                             |
| • between the channels                                  | No                          |
| <b>Galvanic isolation digital outputs</b>               |                             |
| • between the channels                                  | No                          |

| 6ES7 148-6JA00-0AB0                     |                                  |
|-----------------------------------------|----------------------------------|
| <b>Permissible potential difference</b> |                                  |
| between different circuits              | 75 V DC / 60 V AC                |
| <b>Isolation</b>                        |                                  |
| tested with                             | 500 V                            |
| • 24 V DC circuits                      | 1 500 V; According to IEEE 802.3 |
| • Interface                             |                                  |
| IP65                                    | Yes                              |
| IP66                                    | Yes                              |
| IP67                                    | Yes                              |
| <b>Connection method</b>                |                                  |
| M12                                     | Yes                              |
| <b>Dimensions and weight</b>            |                                  |
| <b>Dimensions</b>                       |                                  |
| • Width                                 | 60 mm                            |
| • Height                                | 175 mm                           |
| • Depth                                 | 49 mm                            |
| <b>Weight</b>                           |                                  |
| • Weight                                | 910 g                            |

# SIMATIC ET 200 distributed I/O

## ET 200eco PN

### ET 200eco PN

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Order No.                                                                                                                                                                                            | Order No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ET 200eco PN digital input module</b> <ul style="list-style-type: none"> <li>• 8 DI 24 V DC; 4 x M12, dual assignment, degree of protection IP67</li> <li>• 8 DI 24 V DC; 8 x M12, degree of protection IP67</li> <li>• 16 DI 24 V DC; 8 x M12, dual assignment, degree of protection IP67</li> </ul>                                                                                                                                                                                                 | <b>6ES7 141-6BF00-0AB0</b><br><br><b>6ES7 141-6BG00-0AB0</b><br><br><b>6ES7 141-6BH00-0AB0</b>                                                                                                       | <b>PROFINET M12 connector, can be assembled</b><br>IE FC M12 connector PRO, can be assembled <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 8 units</li> </ul> <b>6GK1 901-0DB20-6AA0</b><br><b>6GK1 901-0DB20-6AA8</b>                                                                                                                                                                                                                                                                                                                                                    |
| <b>ET 200eco PN digital output module</b> <ul style="list-style-type: none"> <li>• 8 DO 24 V DC/0.5 A; 4 x M12, dual assignment, 1 load voltage supply DO; degree of protection IP67</li> <li>• 8 DO 24 V DC/1.3 A; 4 x M12, dual assignment, degree of protection IP67</li> <li>• 8 DO 24 V DC/1.3 A; 8 x M12, degree of protection IP67</li> <li>• 8 DO 24 V DC/2 A; 8 x M12, degree of protection IP67</li> <li>• 16 DO 24 V DC/1.3 A; 8 x M12, dual assignment, degree of protection IP67</li> </ul> | <b>6ES7 142-6BF50-0AB0</b><br><br><b>6ES7 142-6BF00-0AB0</b><br><br><b>6ES7 142-6BG00-0AB0</b><br><br><b>6ES7 142-6BR00-0AB0</b><br><br><b>6ES7 142-6BH00-0AB0</b>                                   | <b>PROFINET M12 connecting cables</b><br>Pre-assembled connecting cable with 2 M12 connectors (D-coded) in various lengths: <ul style="list-style-type: none"> <li>0.3 m</li> <li>0.5 m</li> <li>1.0 m</li> <li>1.5 m</li> <li>2.0 m</li> <li>3.0 m</li> <li>5.0 m</li> <li>10.0 m</li> <li>15.0 m</li> </ul> <b>6XV1 870-8AE30</b><br><b>6XV1 870-8AE50</b><br><b>6XV1 870-8AH10</b><br><b>6XV1 870-8AH15</b><br><b>6XV1 870-8AH20</b><br><b>6XV1 870-8AH30</b><br><b>6XV1 870-8AH50</b><br><b>6XV1 870-8AN10</b><br><b>6XV1 870-8AN15</b>                                            |
| <b>ET 200eco PN digital input/output modules</b> <ul style="list-style-type: none"> <li>• 8 DI/DO 24 V DC/1.3 A; 8 x M12, degree of protection IP67</li> </ul>                                                                                                                                                                                                                                                                                                                                           | <b>6ES7 147-6BG00-0AB0</b>                                                                                                                                                                           | <b>M12 connector for load supply 24 V DC</b><br>Connection socket for infeed of 24 V DC; 4-pin, A-coded, 3 units<br>Connector for passing on the 24 V DC; 4-pin, A-coded, 3 units<br><b>6GK1 907-0DC10-6AA3</b><br><b>6GK1 907-0DB10-6AA3</b>                                                                                                                                                                                                                                                                                                                                          |
| <b>ET 200eco PN analog input modules</b> <ul style="list-style-type: none"> <li>• 8 AI 4 U/I + 4 RTD/TC; 8 x M12, degree of protection IP67</li> </ul>                                                                                                                                                                                                                                                                                                                                                   | <b>6ES7 144-6KD00-0AB0</b>                                                                                                                                                                           | <b>M12 power connection cables</b><br>Pre-assembled power connection cables on both sides with M12 socket and connector 4 x 0.75 mm <sup>2</sup> , in various lengths: <ul style="list-style-type: none"> <li>0.3 m</li> <li>0.5 m</li> <li>1.0 m</li> <li>1.5 m</li> <li>2.0 m</li> <li>3.0 m</li> <li>5.0 m</li> <li>10.0 m</li> <li>15.0 m</li> </ul> <b>6XV1 801-5DE30</b><br><b>6XV1 801-5DE50</b><br><b>6XV1 801-5DH10</b><br><b>6XV1 801-5DH15</b><br><b>6XV1 801-5DH20</b><br><b>6XV1 801-5DH30</b><br><b>6XV1 801-5DH50</b><br><b>6XV1 801-5DN10</b><br><b>6XV1 801-5DN15</b> |
| <b>ET 200eco PN analog output modules</b> <ul style="list-style-type: none"> <li>• 4 AO U/I; 4 x M12, degree of protection IP67</li> </ul>                                                                                                                                                                                                                                                                                                                                                               | <b>6ES7 145-6HD00-0AB0</b>                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>ET 200eco PN IO-Link master module</b> <ul style="list-style-type: none"> <li>• 4 IO-L + 8 DI + 4 DO 24 V DC/1.3 A; 8 x M12, degree of protection IP67</li> </ul>                                                                                                                                                                                                                                                                                                                                     | <b>6ES7 148-6JA00-0AB0</b>                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Accessories</b> <ul style="list-style-type: none"> <li>• PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12</li> <li>• Terminal block for ET 200eco PN, 10 A insulation piercing connecting devices</li> <li>• Spare fuses for terminal block, 10 units</li> <li>• Mounting rail 0.5 m</li> <li>• Profile screw for mounting rail, 50 units</li> <li>• Cap M12 for modules IP67, 10 units</li> <li>• Labels 10 x 7 mm, pastel turquoise, 816 units</li> </ul>                                         | <b>6ES7 148-6CB00-0AA0</b><br><b>6ES7 194-6CA00-0AA0</b><br><b>6ES7 194-6HB00-0AA0</b><br><b>6ES7 194-6GA00-0AA0</b><br><b>6ES7 194-6MA00-0AA0</b><br><b>3RX9 802-0AA00</b><br><b>3RT1 900-1SB10</b> | <b>M12 coupler plug</b><br>Can be assembled, for connecting actuators or sensors, 5-pin<br><b>3RK1 902-4BA00-5AA0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                      | <b>Y cable M12</b><br>For double connection of I/O by means of single cable to ET 200, 5-pin<br><b>6ES7 194-6KA00-0XA0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## ET 200eco PN IO-Link master

### ET 200eco PN IO-Link master

#### Overview



The IO-Link master module ET200eco PN is part of the compact block I/O range ET 200eco PN.

It is characterized by:

- Compact block I/O for processing digital and IO-Link signals for connection to the PROFINET bus system
- Cabinet-free installation to the IP67 degree of protection with M12 connection system
- Extremely rugged and resistant metal housing and casting
- Compact module in housing size 60 mm x 175 mm x 37 mm (W x H x D, short and wide ) with 8 x M12 for digital signals and IO-Link
- PROFINET connection: 2 x M12 and automatic PROFINET address assignment
- 100 Mbit/s data transmission rate
- LLDP neighbor detection without the need for a programming device
- Supply and load voltage connection: 2 x M12
- Channel-specific diagnostics

#### Technical specifications

| 6ES7 148-6JA00-0AB0                        |                                    |
|--------------------------------------------|------------------------------------|
| <b>General information</b>                 |                                    |
| Vendor identification (VendorID)           | 002AH                              |
| Device identifier (DeviceID)               | 0306H                              |
| • 24 V DC                                  | Yes                                |
| • Permissible range, lower limit (DC)      | 20.4 V                             |
| • Permissible range, upper limit (DC)      | 28.8 V                             |
| • Reverse polarity protection              | Yes                                |
| Load voltage 2L+                           |                                    |
| • Rated value (DC)                         | 24 V                               |
| • Permissible range, lower limit (DC)      | 20.4 V                             |
| • Permissible range, upper limit (DC)      | 28.8 V                             |
| • Reverse polarity protection              | Yes                                |
| from load voltage 1L+ (unswitched voltage) | 4 A                                |
| from load voltage 2L+, max.                | 4 A                                |
| <b>Encoder supply</b>                      |                                    |
| Number of outputs                          | 6                                  |
| Output current, rated value                | 200 mA; 100 mA per output to X5-X6 |
| 24 V encoder supply                        |                                    |
| • Short-circuit protection                 | Yes                                |
| <b>Power losses</b>                        |                                    |
| Power loss, typ.                           | 8 W                                |

| 6ES7 148-6JA00-0AB0                                    |            |
|--------------------------------------------------------|------------|
| <b>Digital inputs</b>                                  |            |
| Number of digital inputs                               | 8          |
| Number of simultaneously controllable inputs           |            |
| • all mounting positions                               |            |
| - Concurrently controllable inputs, up to 60 °C        | 8          |
| Input characteristic curve acc. to IEC 1131, Type 3    | Yes        |
| Input voltage                                          |            |
| • Rated value, DC                                      | 24 V       |
| • for signal "0"                                       | -3 to +5 V |
| • for signal "1"                                       | 11 to 30 V |
| Input current                                          |            |
| • for signal "0", max. (permissible quiescent current) | 1.5 mA     |
| • for signal "1", typ.                                 | 7 mA       |
| Input delay (for rated value of input voltage)         |            |
| • for standard inputs                                  |            |
| - at "0" to "1", max.                                  | Typ. 3 ms  |
| - at "1" to "0", max.                                  | Typ. 3 ms  |
| Cable length                                           |            |
| • Cable length unshielded, max.                        | 30 m       |



# SIMATIC ET 200 distributed I/O

## ET 200eco PN IO-Link master

### ET 200eco PN IO-Link master

#### Technical specifications (continued)

| 6ES7 148-6JA00-0AB0                                |                       |
|----------------------------------------------------|-----------------------|
| <b>Digital outputs</b>                             |                       |
| Number of digital outputs                          | 4                     |
| Short-circuit protection                           | Yes; electronic       |
| • Response threshold, typ.                         | 1.8 A                 |
| Limitation of inductive shutdown voltage to        | Typ. (L1+, L2+) -47 V |
| Switching capacity of the outputs                  |                       |
| • on lamp load, max.                               | 5 W                   |
| Controlling a digital input                        | Yes                   |
| Output current                                     |                       |
| • for signal "1" rated value                       | 1.3 A; maximum        |
| • for signal "0" residual current, max.            | 1.5 mA                |
| Parallel switching of 2 outputs                    |                       |
| • for increased power                              | No                    |
| • for redundant control of a load                  | Yes                   |
| Switching frequency                                |                       |
| • with resistive load, max.                        | 100 Hz                |
| • with inductive load, max.                        | 0.5 Hz                |
| • on lamp load, max.                               | 1 Hz                  |
| Aggregate current of outputs (per group)           |                       |
| • up to 60 °C, max.                                | 3.9 A                 |
| Cable length                                       |                       |
| • Cable length unshielded, max.                    | 30 m                  |
| <b>Interfaces</b>                                  |                       |
| Transmission procedure                             | 100BASE-TX            |
| Transmission rate, max.                            | 100 Mbit/s            |
| • Number of PROFINET interfaces                    | 2                     |
| • Autocrossing                                     | Yes                   |
| • Automatic detection of transmission speed        | Yes                   |
| • Integrated switch                                | Yes                   |
| • PROFINET IO Device                               | Yes                   |
| - IRT with the option "high flexibility" supported | Yes                   |
| <b>Protocols</b>                                   |                       |
| PROFINET IO                                        | Yes                   |
| Protocols (Ethernet)                               |                       |
| • SNMP                                             | Yes                   |
| • DCP                                              | Yes                   |
| • LLDP                                             | Yes                   |
| • ping                                             | Yes                   |
| • arp                                              | Yes                   |

| 6ES7 148-6JA00-0AB0                                     |                                  |
|---------------------------------------------------------|----------------------------------|
| <b>Alarms/diagnostics/status information</b>            |                                  |
| Status indicator                                        | Yes; green LED                   |
| Alarms                                                  |                                  |
| • Diagnostic alarm                                      | Yes                              |
| Diagnostics                                             |                                  |
| • Diagnostic functions                                  | Yes                              |
| • Diagnostic information readable                       | Yes                              |
| • Monitoring the supply voltage to the electronics      | Yes; green "ON" LED              |
| • Wire break in actuator cable                          | Yes                              |
| • Wire break in signal transmitter cable                | Yes                              |
| • Short circuit                                         | Yes                              |
| • Short circuit encoder supply                          | Yes                              |
| • Group error                                           | Yes; red/yellow "SF/MT" LED      |
| <b>Galvanic isolation</b>                               |                                  |
| between the load voltages                               | Yes                              |
| between load voltage and all other switching components | No                               |
| between Ethernet and electronics                        | Yes                              |
| Galvanic isolation digital inputs                       |                                  |
| • between the channels                                  | No                               |
| Galvanic isolation digital outputs                      |                                  |
| • between the channels                                  | No                               |
| <b>Permissible potential difference</b>                 |                                  |
| between different circuits                              | 75 V DC / 60 V AC                |
| <b>Isolation</b>                                        |                                  |
| tested with                                             |                                  |
| • 24 V DC circuits                                      | 500 V                            |
| • Interface                                             | 1 500 V; according to IEEE 802.3 |
| IP65                                                    | Yes                              |
| IP66                                                    | Yes                              |
| IP67                                                    | Yes                              |
| <b>Connection method</b>                                |                                  |
| M12                                                     | Yes                              |
| <b>Dimensions and weight</b>                            |                                  |
| Dimensions                                              |                                  |
| • Width                                                 | 60 mm                            |
| • Height                                                | 175 mm                           |
| • Depth                                                 | 49 mm                            |
| Weight                                                  |                                  |
| • Weight                                                | 910 g                            |

# SIMATIC ET 200 distributed I/O

## ET 200eco PN IO-Link master

### ET 200eco PN IO-Link master

| Ordering data                                                                                                                                                                                                                                                                                                                                                       | Order No.                                                                                                                                                                                                                     |                                                                                                                                                                                                                     | Order No.                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IO-Link Master ET 200eco PN</b><br>• 4 IO-L + 8 DE + 4 DA DC 24 V/ 1.3 A; 8 X M12, IP67 degree of protection                                                                                                                                                                                                                                                     | <b>6ES7 148-6JA00-0AB0</b>                                                                                                                                                                                                    | <b>M12 plug-in power cables</b><br>Pre-assembled plug-in power cables, fitted at each end with M12 socket and plug 4 x 0.75 mm <sup>2</sup> , in various lengths:                                                   |                                                                                                                                                                                                                               |
| <b>Accessories</b><br>• Voltage divider PD 24 V DC; 1 X 7/8", 4 X M12<br>• Terminal block for ET 200eco PN, 10 A insulation-piercing<br>• Spare fuses for terminal block, 10 units<br>• Mounting rail 0.5 m<br>• Shaped screw for mounting rail, 50 units<br>• Sealing cap M12 for IP67 modules, 10 units<br>• Labels 10 x 7 mm, pale turquoise, 816 units per pack | <b>6ES7 148-6CB00-0AA0</b><br><b>6ES7 194-6CA00-0AA0</b><br><b>6ES7 194-6HB00-0AA0</b><br><b>6ES7 194-6GA00-0AA0</b><br><b>6ES7 194-6MA00-0AA0</b><br><b>3RK1 901-1KA00</b><br><b>3RT1 900-1SB10</b>                          | 0.3 m<br>0.5 m<br>1.0 m<br>1.5 m<br>2.0 m<br>3.0 m<br>5.0 m<br>10.0 m<br>15.0 m                                                                                                                                     | <b>6XV1 801-5DE30</b><br><b>6XV1 801-5DE50</b><br><b>6XV1 801-5DH10</b><br><b>6XV1 801-5DH15</b><br><b>6XV1 801-5DH20</b><br><b>6XV1 801-5DH30</b><br><b>6XV1 801-5DH50</b><br><b>6XV1 801-5DN10</b><br><b>6XV1 801-5DN15</b> |
| <b>PROFINET M12 cable connector, for user assembly</b><br>IE FC M12 connector PRO, for user assembly<br>• 1 unit<br>• 8 units                                                                                                                                                                                                                                       | <b>6GK1 901-0DB20-6AA0</b><br><b>6GK1 901-0DB20-6AA8</b>                                                                                                                                                                      | <b>M12 coupler plug</b><br>Pre-assembled<br>• For connecting actuators or sensors, 4-pole<br>• For connecting actuators or sensors, 5-pole                                                                          | <b>3RX8 000-0CD40</b><br><b>3RX8 000-0CD55</b>                                                                                                                                                                                |
| <b>PROFINET M12 connecting cables</b><br>Preassembled connecting cables with 2 M12 connectors (D-coded), in various lengths:                                                                                                                                                                                                                                        |                                                                                                                                                                                                                               | <b>M12 angular coupler plug</b><br>For user assembly; for connecting actuators or sensors, 5-pole                                                                                                                   | <b>3RX8 000-0CE55</b>                                                                                                                                                                                                         |
| 0.3 m<br>0.5 m<br>1.0 m<br>1.5 m<br>2.0 m<br>3.0 m<br>5.0 m<br>10.0 m<br>15.0 m                                                                                                                                                                                                                                                                                     | <b>6XV1 870-8AE30</b><br><b>6XV1 870-8AE50</b><br><b>6XV1 870-8AH10</b><br><b>6XV1 870-8AH15</b><br><b>6XV1 870-8AH20</b><br><b>6XV1 870-8AH30</b><br><b>6XV1 870-8AH50</b><br><b>6XV1 870-8AN10</b><br><b>6XV1 870-8AN15</b> | <b>M12 Y cable</b><br>For double connection of I/O by means of a single-cable on ET200, 5-pole                                                                                                                      | <b>6ES7 194-6KA00-0XA0</b>                                                                                                                                                                                                    |
| <b>M12 connector for 24 V DC load power supply</b><br>Socket for 24 V DC incoming supply; 4-pole A-coded, 3 units<br>Cable connector for loop-through of 24 V DC; 4-pole A-coded, 3 units                                                                                                                                                                           | <b>6GK1 907-0DC10-6AA3</b><br><b>6GK1 907-0DB10-6AA3</b>                                                                                                                                                                      | <b>M12 connecting cables (PUR casing)</b><br>Preassembled plug-in cables for connecting digital sensors and actuators<br>Fitted at each end with M12 socket and plug 3 x 0.34 mm <sup>2</sup> , in various lengths: |                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                               | 0.6 m<br>1.0 m<br>1.5 m<br>Fitted at each end with M12 socket and plug 4 x 0.34 mm <sup>2</sup> , in various lengths:                                                                                               | <b>3RX8 000-0GF32-1AA6</b><br><b>3RX8 000-0GF32-1AB0</b><br><b>3RX8 000-0GF32-1AB5</b><br><br><b>3RX8 000-0GF42-1AA6</b><br><b>3RX8 000-0GF42-1AB0</b><br><b>3RX8 000-0GF42-1AB5</b>                                          |

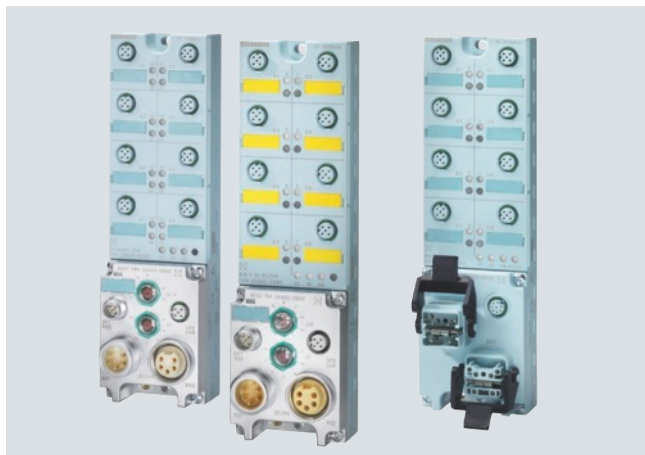
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# SIMATIC ET 200 distributed I/O

## ET 200eco

### ET 200eco

#### Overview



- Compact, cost-effective I/O devices for processing digital signals
- Design without control cabinet with degree of protection IP65/67 with flexible and fast connections
- Comprises a basic module and various connection blocks for application-specific implementation options:
  - ECOFAST: 2 x RS 485 hybrid fieldbus connection with identification plug for setting the PROFIBUS address
  - M12: 2 x M12 and 2 x 7/8" with 2 rotary coding switches for assigning the PROFIBUS address
- Connection block contains T-functionality for bus and power supply so that during commissioning and service, the modules can be disconnected from and reconnected to the PROFIBUS without interruption
- Module variance: 8DI, 16DI, 8DI/8DO (1.3 A), 8DI/8DO (2.0 A), 8DO (2.0 A), 16DO (0.5 A)
- Transmission rates up to 12 Mbit/s
- Fail-safe DI modules 4/8 F-DI with safety-related signal processing according to PROFIsafe

#### Technical specifications

|                                                                                                                           | 6ES7 141-3BF00-0XA0                                                                 | 6ES7 141-3BH00-0XA0                                                                 | 6ES7 148-3FA00-0XB0                |
|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------|
| <b>Supply voltages</b><br>Supply voltage of electronics 1L+                                                               |                                                                                     |                                                                                     |                                    |
| • Rated value (DC)                                                                                                        | 24 V                                                                                | 24 V                                                                                | 24 V                               |
| • Reverse polarity protection                                                                                             | Yes                                                                                 | Yes                                                                                 | No                                 |
| <b>Current consumption</b><br>from supply voltage 1L+, max.                                                               | 70 mA; typically                                                                    | 70 mA; typically                                                                    | 100 mA                             |
| <b>Power losses</b><br>Power loss, typ.                                                                                   | 2.4 W                                                                               | 3.6 W                                                                               | 3 W                                |
| <b>FH technology</b><br>Module for fail-safe applications                                                                 |                                                                                     |                                                                                     | Yes                                |
| <b>Protocols</b><br>PROFIBUS DP protocol                                                                                  | Yes                                                                                 | Yes                                                                                 | Yes                                |
| <b>PROFIBUS DP</b><br>Transmission rate, max.                                                                             | 12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s | 12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s | 12 Mbit/s                          |
| <b>Digital inputs</b><br>Number of digital inputs                                                                         | 8                                                                                   | 16                                                                                  | 8; 8 single channel, 4 two-channel |
| Number of simultaneously control-lable inputs                                                                             | 8; all mounting positions up to 55 °C                                               | 16; all mounting positions up to 55 °C                                              | 8; 8 single channel, 4 two-channel |
| Input characteristic curve acc. to IEC 1131, Type 1                                                                       | Yes                                                                                 | Yes                                                                                 | Yes                                |
| Input voltage<br>• Rated value, DC<br>• for signal "0"<br>• for signal "1"                                                | 24 V<br>-3 to +5 V<br>13 to 30 V                                                    | 24 V<br>-3 to +5 V<br>13 to 30 V                                                    | 24 V<br>-30 to +5 V<br>15 to 30 V  |
| Input current<br>• for signal "1", typ.                                                                                   | 7 mA                                                                                | 7 mA                                                                                | 3.7 mA                             |
| Input delay (for rated value of input voltage)<br>• for standard inputs<br>- at "0" to "1", max.<br>- at "1" to "0", max. | 3 ms; typ.<br>3 ms; typically                                                       | 3 ms; typ.<br>3 ms; typically                                                       |                                    |
| Cable length<br>• Cable length unshielded, max.                                                                           | 30 m                                                                                | 30 m                                                                                | 30 m                               |

**Technical specifications** (continued)

|                                                      | 6ES7 141-3BF00-0XA0                  | 6ES7 141-3BH00-0XA0                  | 6ES7 148-3FA00-0XB0                           |
|------------------------------------------------------|--------------------------------------|--------------------------------------|-----------------------------------------------|
| <b>Encoder supply</b>                                |                                      |                                      |                                               |
| Number of outputs                                    | 8                                    | 8                                    | 2                                             |
| Output voltage                                       | 24 V DC                              | 24 V DC                              | min. L+ (-1.5 V)                              |
| Output current, rated value                          | 1 A; aggregate current up to 55 °C   | 1 A; aggregate current up to 55 °C   | 300 mA                                        |
| Short-circuit protection                             | Yes; electronic                      | Yes; electronic                      | Yes                                           |
| <b>Encoder</b>                                       |                                      |                                      |                                               |
| Connectable encoders                                 |                                      |                                      |                                               |
| • 2-wire BEROs                                       | Yes                                  | Yes                                  | No                                            |
| - permissible quiescent current (2-wire BEROs), max. | 1.5 mA                               | 1.5 mA                               |                                               |
| <b>Alarms/diagnostics/status information</b>         |                                      |                                      |                                               |
| Status indicator                                     | Yes                                  | Yes                                  |                                               |
| Alarms                                               |                                      |                                      |                                               |
| • Alarms                                             | No                                   | No                                   |                                               |
| Diagnostics                                          |                                      |                                      |                                               |
| • Diagnostics                                        | Yes; diagnostic information readable | Yes; diagnostic information readable |                                               |
| Diagnostic indication LED                            |                                      |                                      |                                               |
| • Group error SF (red)                               | Yes                                  | Yes                                  | Yes                                           |
| • Status indicator digital input (green)             | Yes                                  | Yes                                  | Yes                                           |
| • Channel error indicator F (red)                    | No                                   | No                                   | No                                            |
| <b>Isolation</b>                                     |                                      |                                      |                                               |
| Isolation checked with                               | 500 V DC                             | 500 V DC                             | 500 V AC for 1 min.                           |
| <b>Galvanic isolation</b>                            |                                      |                                      |                                               |
| between PROFIBUS DP and all other circuit components | Yes                                  | Yes                                  | Yes                                           |
| Galvanic isolation digital inputs                    |                                      |                                      |                                               |
| • between the channels                               | No                                   | No                                   | No                                            |
| <b>Permissible potential difference</b>              |                                      |                                      |                                               |
| between different circuits                           | 75 V DC / 60 V AC                    | 75 V DC / 60 V AC                    | 75 V DC / 60 V AC                             |
| <b>Standards, approvals, certificates</b>            |                                      |                                      |                                               |
| Highest safety class achievable in safety mode       |                                      |                                      |                                               |
| • acc. to EN 954                                     |                                      |                                      | Cat. 3 (single-channel), Cat. 4 (two-channel) |
| • acc. to IEC 61508                                  |                                      |                                      | SIL 2 (single-channel), SIL 3 (two-channel)   |
| <b>General information</b>                           |                                      |                                      |                                               |
| Vendor identification (VendorID)                     | 80DBh                                | 80DAh                                |                                               |
| <b>Dimensions and weight</b>                         |                                      |                                      |                                               |
| Dimensions                                           |                                      |                                      |                                               |
| • Width                                              | 60 mm                                | 60 mm                                | 60 mm                                         |
| • Height                                             | 210 mm                               | 210 mm                               | 210 mm                                        |
| • Depth                                              | 28 mm                                | 28 mm                                | 28 mm                                         |
| Weight                                               |                                      |                                      |                                               |
| • Weight, approx.                                    | 210 g                                | 210 g                                | 220 g                                         |

# SIMATIC ET 200 distributed I/O

## ET 200eco

### ET 200eco

#### Technical specifications (continued)

|                                                         | 6ES7 142-3BF00-0XA0                                                                                                               | 6ES7 142-3BH00-0XA0                                                                 |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                                  |                                                                                                                                   |                                                                                     |
| Supply voltage of electronics 1L+                       |                                                                                                                                   |                                                                                     |
| • Rated value (DC)                                      | 24 V                                                                                                                              | 24 V                                                                                |
| • Reverse polarity protection                           | Yes                                                                                                                               | Yes                                                                                 |
| Load voltage 2L+                                        |                                                                                                                                   |                                                                                     |
| • Rated value (DC)                                      | 24 V                                                                                                                              | 24 V                                                                                |
| • Reverse polarity protection                           | Yes                                                                                                                               | Yes                                                                                 |
| <b>Current consumption</b>                              |                                                                                                                                   |                                                                                     |
| from load voltage 2L+ (without load), max.              | 60 mA; typically                                                                                                                  | 80 mA; typically                                                                    |
| from supply voltage 1L+, max.                           | 70 mA; typically                                                                                                                  | 70 mA; typically                                                                    |
| <b>Power losses</b>                                     |                                                                                                                                   |                                                                                     |
| Power loss, typ.                                        | 4 W                                                                                                                               | 4 W                                                                                 |
| <b>Protocols</b>                                        |                                                                                                                                   |                                                                                     |
| PROFIBUS DP protocol                                    | Yes                                                                                                                               | Yes                                                                                 |
| <b>PROFIBUS DP</b>                                      |                                                                                                                                   |                                                                                     |
| Transmission rate, max.                                 | 12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s                                               | 12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s |
| <b>Digital outputs</b>                                  |                                                                                                                                   |                                                                                     |
| Number of digital outputs                               | 8                                                                                                                                 | 16                                                                                  |
| Short-circuit protection                                | Yes; electronic                                                                                                                   | Yes; electronic                                                                     |
| • Response threshold, typ.                              | 4 A per channel                                                                                                                   | 1.4 A (per channel)                                                                 |
| Limitation of inductive shutdown voltage to             | 2L+ (-44 V)                                                                                                                       | 2L+ (-47 V)                                                                         |
| Lamp load, max.                                         | 10 W                                                                                                                              | 5 W                                                                                 |
| Controlling a digital input                             | Yes                                                                                                                               | Yes                                                                                 |
| Output voltage                                          |                                                                                                                                   |                                                                                     |
| • for signal "1", min.                                  | 2L+ (-0.8 V)                                                                                                                      | 2L+ (-0.8 V)                                                                        |
| Output current                                          |                                                                                                                                   |                                                                                     |
| • for signal "1" rated value                            | 2 A                                                                                                                               | 0.5 A                                                                               |
| • for signal "1" permissible range for 0 to 55 °C, min. | 5 mA                                                                                                                              | 5 mA                                                                                |
| • for signal "1" permissible range for 0 to 55 °C, max. | 2.4 A                                                                                                                             | 1 A                                                                                 |
| • for signal "0" residual current, max.                 | 0.5 mA                                                                                                                            | 0.1 mA                                                                              |
| Parallel switching of 2 outputs                         |                                                                                                                                   |                                                                                     |
| • for increased power                                   | No                                                                                                                                | No                                                                                  |
| • for redundant control of a load                       | Yes                                                                                                                               | Yes                                                                                 |
| Switching frequency                                     |                                                                                                                                   |                                                                                     |
| • with resistive load, max.                             | 100 Hz                                                                                                                            | 100 Hz                                                                              |
| • with inductive load, max.                             | 0.5 Hz; to IEC 947-5-1, DC13                                                                                                      | 0.5 Hz; to IEC 947-5-1, DC13                                                        |
| • on lamp load, max.                                    | 1 Hz                                                                                                                              | 1 Hz                                                                                |
| Aggregate current of outputs (per group)                |                                                                                                                                   |                                                                                     |
| • up to 55 °C, max.                                     | 4 A; 4 A each for sockets X1, X3, X5, X7 and 4 A each for sockets X2, X4, X6, X8; note the current carrying capacity of the cable | 4 A; Please note the current carrying capacity of the cable!                        |
| Load resistance range                                   |                                                                                                                                   |                                                                                     |
| • lower limit                                           | 12 Ω                                                                                                                              | 12 Ω                                                                                |
| • upper limit                                           | 4 kΩ                                                                                                                              | 4 kΩ                                                                                |
| Cable length                                            |                                                                                                                                   |                                                                                     |
| • Cable length unshielded, max.                         | 30 m                                                                                                                              | 30 m                                                                                |
| <b>Alarms/diagnostics/status information</b>            |                                                                                                                                   |                                                                                     |
| Status indicator                                        | Yes                                                                                                                               | Yes                                                                                 |
| Alarms                                                  |                                                                                                                                   |                                                                                     |
| • Alarms                                                | No                                                                                                                                | No                                                                                  |
| Diagnostics                                             |                                                                                                                                   |                                                                                     |
| • Diagnostics                                           | Yes; diagnostic information readable                                                                                              | Yes; diagnostic information readable                                                |

**Technical specifications (continued)**

|                                                      | 6ES7 142-3BF00-0XA0 | 6ES7 142-3BH00-0XA0 |
|------------------------------------------------------|---------------------|---------------------|
| Diagnostics indication LED                           |                     |                     |
| • Group error SF (red)                               | Yes                 | Yes                 |
| • Status indicator digital output (green)            | Yes                 | Yes                 |
| • Channel error indicator F (red)                    | No                  | No                  |
| <b>Isolation</b>                                     |                     |                     |
| Isolation checked with                               | 500 V DC            | 500 V DC            |
| <b>Galvanic isolation</b>                            |                     |                     |
| between PROFIBUS DP and all other circuit components | Yes                 | Yes                 |
| Galvanic isolation digital outputs                   |                     |                     |
| • between the channels                               | No                  | No                  |
| <b>Permissible potential difference</b>              |                     |                     |
| between different circuits                           | 75 V DC / 60 V AC   | 75 V DC / 60 V AC   |
| <b>General information</b>                           |                     |                     |
| Vendor identification (VendorID)                     | 80DDh               | 80FBh               |
| <b>Dimensions and weight</b>                         |                     |                     |
| Dimensions                                           |                     |                     |
| • Width                                              | 60 mm               | 60 mm               |
| • Height                                             | 210 mm              | 210 mm              |
| • Depth                                              | 28 mm               | 28 mm               |
| Weight                                               |                     |                     |
| • Weight, approx.                                    | 210 g               | 210 g               |

|                                                     | 6ES7 143-3BH00-0XA0                                                                 | 6ES7 143-3BH10-0XA0                                                                 |
|-----------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                              |                                                                                     |                                                                                     |
| Supply voltage of electronics 1L+                   |                                                                                     |                                                                                     |
| • Rated value (DC)                                  | 24 V                                                                                | 24 V                                                                                |
| • Reverse polarity protection                       | No                                                                                  | Yes                                                                                 |
| Load voltage 2L+                                    |                                                                                     |                                                                                     |
| • Rated value (DC)                                  | 24 V                                                                                | 24 V                                                                                |
| • Reverse polarity protection                       | No                                                                                  | Yes                                                                                 |
| <b>Current consumption</b>                          |                                                                                     |                                                                                     |
| from load voltage 2L+ (without load), max.          | 60 mA; typically                                                                    | 60 mA; typically                                                                    |
| from supply voltage 1L+, max.                       | 70 mA; typically                                                                    | 70 mA; typically                                                                    |
| <b>Power losses</b>                                 |                                                                                     |                                                                                     |
| Power loss, typ.                                    | 5 W                                                                                 | 5 W                                                                                 |
| <b>Protocols</b>                                    |                                                                                     |                                                                                     |
| PROFIBUS DP protocol                                | Yes                                                                                 | Yes                                                                                 |
| <b>PROFIBUS DP</b>                                  |                                                                                     |                                                                                     |
| Transmission rate, max.                             | 12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s | 12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1.5 / 3 / 6 / 12 Mbit/s |
| <b>Digital inputs</b>                               |                                                                                     |                                                                                     |
| Number of digital inputs                            | 8                                                                                   | 8                                                                                   |
| Number of simultaneously controllable inputs        | 8; all mounting positions up to 55 °C                                               | 8; all mounting positions up to 55 °C                                               |
| Input characteristic curve acc. to IEC 1131, Type 1 | Yes                                                                                 | Yes                                                                                 |
| Input voltage                                       |                                                                                     |                                                                                     |
| • Rated value, DC                                   | 24 V                                                                                | 24 V                                                                                |
| • for signal "0"                                    | -3 to +5 V                                                                          | -3 to +5 V                                                                          |
| • for signal "1"                                    | 13 to 30 V                                                                          | 13 to 30 V                                                                          |
| Input current                                       |                                                                                     |                                                                                     |
| • for signal "1", typ.                              | 7 mA                                                                                | 7 mA                                                                                |
| Input delay (for rated value of input voltage)      |                                                                                     |                                                                                     |
| • for standard inputs                               |                                                                                     |                                                                                     |
| - at "0" to "1", max.                               | 3 ms; typ.                                                                          | 3 ms; typ.                                                                          |
| - at "1" to "0", max.                               | 3 ms; typically                                                                     | 3 ms; typically                                                                     |

# SIMATIC ET 200 distributed I/O

## ET 200eco

### ET 200eco

#### Technical specifications (continued)

|                                                         | 6ES7 143-3BH00-0XA0                                                                                                               | 6ES7 143-3BH10-0XA0                                            |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <b>Digital outputs</b>                                  |                                                                                                                                   |                                                                |
| Number of digital outputs                               | 8                                                                                                                                 | 8                                                              |
| Short-circuit protection                                | Yes; electronic                                                                                                                   | Yes; electronic                                                |
| • Response threshold, typ.                              | 4 A per channel                                                                                                                   | 4 A per channel                                                |
| Limitation of inductive shutdown voltage to             | 2L+ (-44 V)                                                                                                                       | 2L+ (-44 V)                                                    |
| Lamp load, max.                                         | 10 W                                                                                                                              | 10 W                                                           |
| Controlling a digital input                             | Yes                                                                                                                               | Yes                                                            |
| Output voltage                                          |                                                                                                                                   |                                                                |
| • for signal "1", min.                                  | 2L+ (-0.8 V)                                                                                                                      | 2L+ (-1.2 V)                                                   |
| Output current                                          |                                                                                                                                   |                                                                |
| • for signal "1" rated value                            | 2 A                                                                                                                               | 1.3 A                                                          |
| • for signal "1" permissible range for 0 to 55 °C, min. | 5 mA                                                                                                                              | 5 mA                                                           |
| • for signal "1" permissible range for 0 to 55 °C, max. | 2.4 A                                                                                                                             | 1.8 A                                                          |
| • for signal "0" residual current, max.                 | 0.5 mA                                                                                                                            | 0.5 mA                                                         |
| Parallel switching of 2 outputs                         |                                                                                                                                   |                                                                |
| • for increased power                                   | No                                                                                                                                | No                                                             |
| • for redundant control of a load                       | Yes                                                                                                                               | Yes                                                            |
| Switching frequency                                     |                                                                                                                                   |                                                                |
| • with resistive load, max.                             | 100 Hz                                                                                                                            | 100 Hz                                                         |
| • with inductive load, max.                             | 0.5 Hz; to IEC 947-5-1, DC13                                                                                                      | 0.5 Hz; to IEC 947-5-1, DC13                                   |
| • on lamp load, max.                                    | 1 Hz                                                                                                                              | 1 Hz                                                           |
| Aggregate current of outputs (per group)                |                                                                                                                                   |                                                                |
| • up to 55 °C, max.                                     | 4 A; 4 A each for sockets X1, X3, X5, X7 and 4 A each for sockets X2, X4, X6, X8; note the current carrying capacity of the cable | 5.2 A; please note the current carrying capacity of the cable! |
| Load resistance range                                   |                                                                                                                                   |                                                                |
| • lower limit                                           | 12 Ω                                                                                                                              | 12 Ω                                                           |
| • upper limit                                           | 4 kΩ                                                                                                                              | 4 kΩ                                                           |
| Cable length                                            |                                                                                                                                   |                                                                |
| • Cable length unshielded, max.                         | 30 m                                                                                                                              | 30 m                                                           |
| <b>Encoder supply</b>                                   |                                                                                                                                   |                                                                |
| Number of outputs                                       | 8                                                                                                                                 | 8                                                              |
| Output voltage                                          | 24 V DC                                                                                                                           |                                                                |
| Output current, rated value                             | 0.75 A; up to 55°C max. 0.75 A (summation current)                                                                                | 1 A; up to 55°C max. 1 A (summation current)                   |
| Short-circuit protection                                | Yes; electronic                                                                                                                   | Yes; electronic                                                |
| <b>Encoder</b>                                          |                                                                                                                                   |                                                                |
| Connectable encoders                                    |                                                                                                                                   |                                                                |
| • 2-wire BEROs                                          | Yes                                                                                                                               | Yes                                                            |
| - permissible quiescent current (2-wire BEROs), max.    | 1.5 mA                                                                                                                            | 1.5 mA                                                         |
| <b>Alarms/diagnostics/status information</b>            |                                                                                                                                   |                                                                |
| Status indicator                                        | Yes                                                                                                                               | Yes                                                            |
| Alarms                                                  |                                                                                                                                   |                                                                |
| • Alarms                                                | No                                                                                                                                | No                                                             |
| Diagnostics                                             |                                                                                                                                   |                                                                |
| • Diagnostics                                           | Yes; diagnostic information readable                                                                                              | Yes; diagnostic information readable                           |
| Diagnostics indication LED                              |                                                                                                                                   |                                                                |
| • Group error SF (red)                                  | Yes                                                                                                                               | Yes                                                            |
| • Status indicator digital output (green)               | Yes                                                                                                                               | Yes                                                            |
| • Status indicator digital input (green)                | Yes                                                                                                                               | Yes                                                            |
| • Channel error indicator F (red)                       | No                                                                                                                                | No                                                             |

**Technical specifications** (continued)

|                                                      | 6ES7 143-3BH00-0XA0                                                                        | 6ES7 143-3BH10-0XA0                                                                        |
|------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Isolation</b>                                     |                                                                                            |                                                                                            |
| Isolation checked with                               | 500 V DC                                                                                   | 500 V DC                                                                                   |
| <b>Galvanic isolation</b>                            |                                                                                            |                                                                                            |
| between PROFIBUS DP and all other circuit components | Yes                                                                                        | Yes                                                                                        |
| Galvanic isolation digital inputs                    |                                                                                            |                                                                                            |
| • between the channels                               | No                                                                                         | No                                                                                         |
| Galvanic isolation digital outputs                   |                                                                                            |                                                                                            |
| • between the channels                               | No                                                                                         | No                                                                                         |
| <b>Permissible potential difference</b>              |                                                                                            |                                                                                            |
| between different circuits                           | 75 V DC / 60 V AC                                                                          | 75 V DC / 60 V AC                                                                          |
| <b>General information</b>                           |                                                                                            |                                                                                            |
| Vendor identification (VendorID)                     | 80DCh                                                                                      | 80FCh                                                                                      |
| <b>Dimensions and weight</b>                         |                                                                                            |                                                                                            |
| Dimensions                                           |                                                                                            |                                                                                            |
| • Width                                              | 60 mm                                                                                      | 60 mm                                                                                      |
| • Height                                             | 210 mm                                                                                     | 210 mm                                                                                     |
| • Depth                                              | 28 mm                                                                                      | 28 mm                                                                                      |
| Weight                                               |                                                                                            |                                                                                            |
| • Weight, approx.                                    | 210 g                                                                                      | 210 g                                                                                      |
|                                                      | 6ES7 194-3AA00-0AA0                                                                        | 6ES7 194-3AA00-0BA0                                                                        |
| <b>Power losses</b>                                  |                                                                                            |                                                                                            |
| Power loss, typ.                                     | 2 W; The power loss depends on the current that you loop through via the connection block. | 2 W; The power loss depends on the current that you loop through via the connection block. |
| <b>Dimensions and weight</b>                         |                                                                                            |                                                                                            |
| Dimensions                                           |                                                                                            |                                                                                            |
| • Width                                              | 79 mm                                                                                      | 79 mm                                                                                      |
| • Height                                             | 60 mm                                                                                      | 60 mm                                                                                      |
| • Depth                                              | 30 mm                                                                                      | 29 mm                                                                                      |
| Weight                                               |                                                                                            |                                                                                            |
| • Weight, approx.                                    | 313 g                                                                                      | 392 g                                                                                      |



# SIMATIC ET 200 distributed I/O

## ET 200eco

### ET 200eco

| Ordering data                                                                                                                                                                                                                                                                                                                                  | Order No.                                                                                        | Order No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BM 141 ET 200eco basic modules</b> <ul style="list-style-type: none"> <li>8 DI 24 V DC 8 x M12, individual assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately</li> <li>16 DI 24 V DC 8 x M12, double assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately</li> </ul>              | <b>6ES7 141-3BF00-0XA0</b><br><br><b>6ES7 141-3BH00-0XA0</b>                                     | <b>Accessories for M12 connection block, 7/8"</b><br><br><b>PROFIBUS M12 cable connector</b><br>1 pack = 5 units <ul style="list-style-type: none"> <li>Male insert</li> <li>Female insert</li> </ul> <b>PROFIBUS M12 connecting cable</b><br>for PROFIBUS DP, 1 pack = 5 units <ul style="list-style-type: none"> <li>Male insert</li> </ul> <b>PROFIBUS M12 connecting cable</b><br>Pre-assembled 2-wire (inverse coded) with M12 connectors (straight) in various lengths: <ul style="list-style-type: none"> <li>0.3 m</li> <li>0.5 m</li> <li>1.0 m</li> <li>1.5 m</li> <li>2.0 m</li> <li>3.0 m</li> <li>5.0 m</li> <li>10.0 m</li> <li>15.0 m</li> <li>Other special lengths with 90° or 180° cable outlet</li> </ul> |
| <b>BM 142 ET 200eco basic module</b> <ul style="list-style-type: none"> <li>8 DO 24 V DC/1.2 A 8 x M12, individual assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately</li> <li>16 DO 24 V DC/0.5 A 8 x M12, double assignment, IP65/67; connection block 6ES7 194-3AA00-0.A0 to be ordered separately</li> </ul> | <b>6ES7 142-3BF00-0XA0</b><br><br><b>6ES7 142-3BH00-0XA0</b>                                     | <b>6GK1 905-0EA00</b><br><b>6GK1 905-0EB00</b><br><br><b>6GK1 905-0EC00</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>BM 143 ET 200eco basic modules</b> <ul style="list-style-type: none"> <li>8 DI/8 DO, 2 A 8 x M12, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately</li> <li>8 DI/8 DO, 1.3 A 8 x M12, double assignment, IP65/67 connection block 6ES7 194-3AA00-0.A0 to be ordered separately</li> </ul>                               | <b>6ES7 143-3BH00-0XA0</b><br><br><b>6ES7 143-3BH10-0XA0</b>                                     | <b>6XV1 830-3DE30</b><br><b>6XV1 830-3DE50</b><br><b>6XV1 830-3DH10</b><br><b>6XV1 830-3DH15</b><br><b>6XV1 830-3DH20</b><br><b>6XV1 830-3DH30</b><br><b>6XV1 830-3DH50</b><br><b>6XV1 830-3DN10</b><br><b>6XV1 830-3DN15</b><br>see <a href="http://support.automation.siemens.com/WW/view/en/26999294">http://support.automation.siemens.com/WW/view/en/26999294</a>                                                                                                                                                                                                                                                                                                                                                       |
| <b>BM 148 ET 200eco basic modules</b> <ul style="list-style-type: none"> <li>4/8 F-DI, 8 x M12, connection block 6ES7194-3AA00-0.A0 to be ordered separately</li> </ul>                                                                                                                                                                        | <b>6ES7 148-3FA00-0XB0</b>                                                                       | <b>7/8" connector</b><br>1 pack = 5 units <ul style="list-style-type: none"> <li>Male contact insert, straight</li> <li>Male contact insert, angled</li> <li>Female contact insert, straight</li> <li>Female contact insert, angled</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>ECOFAST connection block</b><br>for ET 200eco, 2 x ECOFAST connection RS485 identification connector for PROFIBUS DP, address setting                                                                                                                                                                                                       | <b>6ES7 194-3AA00-0AA0</b>                                                                       | <b>6GK1 905-0FA00</b><br><b>3RK1 902-3BA00</b><br><b>6GK1 905-0FB00</b><br><b>3RK1 902-3DA00</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>M12 connection block, 7/8"</b><br>for ET 200eco, 2 x M12 and 2 x 7/8" 2 rotary coding switch for PROFIBUS DP, address setting                                                                                                                                                                                                               | <b>6ES7 194-3AA00-0BA0</b>                                                                       | <b>7/8" covering caps</b><br>1 pack = 10 units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Accessories for ECOFAST connection block</b><br><br><b>PROFIBUS ECOFAST hybrid plug</b> <ul style="list-style-type: none"> <li>Female contact insert, straight</li> <li>Female contact insert, angled</li> <li>Male contact insert, straight</li> <li>Male contact insert, angled</li> </ul>                                                | <b>6GK1 905-0CB00</b><br><b>6GK1 905-0CD00</b><br><b>6GK1 905-0CA00</b><br><b>6GK1 905-0CC00</b> | <b>7/8" connecting cable to power supply</b><br>Pre-assembled 5-wire cable with 7/8" connectors (straight) in various lengths: <ul style="list-style-type: none"> <li>0.3 m</li> <li>0.5 m</li> <li>1.0 m</li> <li>1.5 m</li> <li>2.0 m</li> <li>3.0 m</li> <li>5.0 m</li> <li>10.0 m</li> <li>15.0 m</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>PROFIBUS ECOFAST terminating plug ECOFAST terminating resistor for PROFIBUS DP</b> <ul style="list-style-type: none"> <li>1 pack = 1 unit</li> <li>1 pack = 5 units</li> </ul>                                                                                                                                                              | <b>6GK1 905-0DA10</b><br><b>6GK1 905-0DA00</b>                                                   | <b>6XV1 822-5BE30</b><br><b>6XV1 822-5BE50</b><br><b>6XV1 822-5BH10</b><br><b>6XV1 822-5BH15</b><br><b>6XV1 822-5BH20</b><br><b>6XV1 822-5BH30</b><br><b>6XV1 822-5BH50</b><br><b>6XV1 822-5BN10</b><br><b>6XV1 822-5BN15</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>PROFIBUS ECOFAST</b><br>Hybrid cable – Cu                                                                                                                                                                                                                                                                                                   | See ECOFAST bus cables                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

F: Subject to export regulations AL: N and ECCN: EAR99

I: Subject to export regulations AL: N and ECCN: EAR99H

| Ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Order No. | Order No.                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>7/8" connecting cable to power supply</b><br>Pre-assembled 5-wire cable with 7/8" connectors (straight) in various lengths: <ul style="list-style-type: none"> <li>• 3.0 m F <b>3RK1 902-3NB30</b></li> <li>• 5.0 m F <b>3RK1 902-3NB50</b></li> <li>• 10.0 m F <b>3RK1 902-3NC10</b></li> <li>• Other special lengths with 90° or 180° cable outlet see <a href="http://support.automation.siemens.com/WW/view/en/26999294">http://support.automation.siemens.com/WW/view/en/26999294</a></li> </ul> |           | <b>"Distributed Safety" V5.4 F programming tool</b><br>Floating License for 1 user, with documentation, 3 languages (German, English, French), on CD, runs on STEP 7 V5.3 SP3 or higher<br><b>6ES7 833-1FC02-0YA5</b>                                                                                               |
| <b>Other accessories</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |                                                                                                                                                                                                                                                                                                                     |
| <b>Identification plug</b><br>for setting of the PROFIBUS node address<br><b>6ES7 194-1KB00-0XA0</b>                                                                                                                                                                                                                                                                                                                                                                                                     |           | <b>"Distributed Safety" F programming tool</b><br>Upgrade from V5.x to V5.4<br><b>6ES7 833-1FC02-0YE5</b>                                                                                                                                                                                                           |
| <b>M12 Y circular connector</b><br>For double connection of sensors via a single cable, 5-pole; cannot be used for F DI 4/8<br><b>6ES7 194-1KA01-0XA0</b>                                                                                                                                                                                                                                                                                                                                                |           | <b>"Distributed Safety" F programming tool</b><br>Software Update Service for 1 year, with automatic extension; latest software version required<br><b>6ES7 833-1FC00-0YX2</b>                                                                                                                                      |
| <b>M12 Y cable</b><br>For double connection of sensors via a single cable, 5-pole; cannot be used for F DI 4/8<br><b>6ES7 194-6KA00-0XA0</b>                                                                                                                                                                                                                                                                                                                                                             |           | <b>S7 Manual Collection</b> J <b>6ES7 998-8XC01-8YE0</b><br>Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication) |
| <b>M12 coupler plug</b><br>for connecting actuators or sensors, 5-pole<br><b>3RK1 902-4BA00-5AA0</b>                                                                                                                                                                                                                                                                                                                                                                                                     |           | <b>S7 Manual Collection update service for 1 year</b> D <b>6ES7 998-8XC01-8YE2</b><br>Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates                                                                                                                                        |
| <b>M12 covering caps</b><br>for sealing of unused I/O sockets<br><b>3RX9 802-0AA00</b>                                                                                                                                                                                                                                                                                                                                                                                                                   |           |                                                                                                                                                                                                                                                                                                                     |
| <b>Labels</b><br><b>3RT1 900-1SB20</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |                                                                                                                                                                                                                                                                                                                     |
| <b>Module description "Distributed I/O device ET 200eco" excluding F-DI</b> <ul style="list-style-type: none"> <li>• paper version, German <b>6ES7 198-8GA00-8AA0</b></li> <li>• paper version, English <b>6ES7 198-8GA00-8BA0</b></li> <li>• paper version, French <b>6ES7 198-8GA00-8CA0</b></li> </ul>                                                                                                                                                                                                |           |                                                                                                                                                                                                                                                                                                                     |

D: Subject to export regulations AL: N and ECCN: 5D992

F: Subject to export regulations AL: N and ECCN: EAR99

J: Subject to export regulations AL: N and ECCN: EAR99S

# SIMATIC ET 200 distributed I/O

## ET 200R

### ET 200R

#### Overview



- Distributed I/O to the degree of protection IP65
- Die-cast aluminum housing
- Integrated repeater
- Parameterizable inputs/ outputs: 8 DI/8 DO up to 16 DI
- Terminal strip at rear for connecting up analog signals for welding transformers
- Connection through hybrid line to 17-pin M23 connector

#### Technical specifications

|                                                     | 6ES7 143-2BH00-0AB0                                                  | 6ES7 143-2BH50-0AB0                                                  |
|-----------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|
| <b>Supply voltages</b>                              |                                                                      |                                                                      |
| Rated value                                         |                                                                      |                                                                      |
| • 24 V DC                                           | Yes; -15 / +20 %                                                     | Yes; -15 / +20 %                                                     |
| • Permissible range, lower limit (DC)               | 20.4 V                                                               | 20.4 V                                                               |
| • Permissible range, upper limit (DC)               | 28.8 V                                                               | 28.8 V                                                               |
| • Reverse polarity protection                       | Yes; also electronic protection                                      | Yes; also electronic protection                                      |
| <b>Connection method</b>                            |                                                                      |                                                                      |
| Bus cables                                          | Bus and voltage: X01/X02: 2x M23 (17-pin)                            | Bus and voltage: X01/X02: 2x M23 (17-pin)                            |
| Inputs/outputs                                      | 8x 5-pin M12x1 circular connector                                    | 8x 5-pin M12x1 circular connector                                    |
| <b>Protocols</b>                                    |                                                                      |                                                                      |
| PROFIBUS DP protocol                                | Yes; ramp-up time at 12 Mbit/s: approx. 80 ms                        | Yes                                                                  |
| <b>PROFIBUS DP</b>                                  |                                                                      |                                                                      |
| Cable length, max.                                  | 30 m; per line, shielded                                             | 30 m; per line, shielded                                             |
| <b>Digital inputs</b>                               |                                                                      |                                                                      |
| Number of digital inputs                            | 8; 16 process channels, 8 DI fixed, 8 DI/DO can be set in parameters | 8; 16 process channels, 8 DI fixed, 8 DI/DO can be set in parameters |
| Input characteristic curve acc. to IEC 1131, Type 2 | Yes                                                                  | Yes                                                                  |
| Input voltage                                       |                                                                      |                                                                      |
| • for signal "0"                                    | -3 to +5 V                                                           | -3 to +5 V                                                           |
| • for signal "1"                                    | 15 to 30 V                                                           | 15 to 30 V                                                           |
| Input current                                       |                                                                      |                                                                      |
| • for signal "1", typ.                              | 7 mA                                                                 | 7 mA                                                                 |
| Input delay (for rated value of input voltage)      |                                                                      |                                                                      |
| • for standard inputs                               |                                                                      |                                                                      |
| - at "0" to "1", max.                               | 3 ms; typ.                                                           | 3 ms; typ.                                                           |
| Cable length                                        |                                                                      |                                                                      |
| • Cable length unshielded, max.                     | 10 m; for signal lines                                               | 10 m; for signal lines                                               |

**Technical specifications** (continued)

|                                                         | 6ES7 143-2BH00-0AB0                                                  | 6ES7 143-2BH50-0AB0                                                  |
|---------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|
| <b>Digital outputs</b>                                  |                                                                      |                                                                      |
| Number of digital outputs                               | 8; 16 process channels, 8 DI fixed, 8 DI/DO can be set in parameters | 8; 16 process channels, 8 DI fixed, 8 DI/DO can be set in parameters |
| Short-circuit protection                                | Yes; electronic                                                      | Yes; electronic                                                      |
| Output current                                          |                                                                      |                                                                      |
| • for signal "1" permissible range for 0 to 55 °C, max. | 0.5 A                                                                | 0.5 A                                                                |
| Switching frequency                                     |                                                                      |                                                                      |
| • with resistive load, max.                             | 100 Hz                                                               | 100 Hz                                                               |
| Aggregate current of outputs (per group)                |                                                                      |                                                                      |
| • up to 55 °C, max.                                     | 2 A                                                                  | 2 A                                                                  |
| Cable length                                            |                                                                      |                                                                      |
| • Cable length unshielded, max.                         | 10 m                                                                 | 10 m                                                                 |
| <b>Encoder supply</b>                                   |                                                                      |                                                                      |
| Number of outputs                                       | 8                                                                    | 8                                                                    |
| Output current, rated value                             | 0.5 A; 8 channels each                                               | 0.5 A; 8 channels each                                               |
| <b>Encoder</b>                                          |                                                                      |                                                                      |
| Connectable encoders                                    |                                                                      |                                                                      |
| • 2-wire BEROs                                          | Yes                                                                  | Yes                                                                  |
| <b>Alarms/diagnostics/status information</b>            |                                                                      |                                                                      |
| Diagnostics                                             |                                                                      |                                                                      |
| • Diagnostic functions                                  | Yes; diagnostic frames                                               | Yes; diagnostic frames                                               |
| • Short circuit                                         | Yes; (digital outputs) per group; X0 to X1 or X2 to X3               | Yes; (digital outputs) per group; X0 to X1 or X2 to X3               |
| • Short circuit encoder supply                          | Yes; per group X0 to X3 or X4 to X7                                  | Yes; per group X0 to X3 or X4 to X7                                  |
| • Missing load voltage                                  | Yes                                                                  | Yes                                                                  |
| Diagnostic indication LED                               |                                                                      |                                                                      |
| • Description                                           | Channel 01, Channel 02                                               | Channel 01, Channel 02                                               |
| • Bus fault BF (red)                                    | Yes                                                                  | Yes                                                                  |
| • Rated load voltage PWR (green)                        | Yes; 24 V DC (load voltage) US2                                      | Yes; 24 V DC (load voltage) US2                                      |
| • Group error SF (red)                                  | Yes                                                                  | Yes                                                                  |
| • Status indicator digital output (green)               | Yes                                                                  | Yes                                                                  |
| • Status indicator digital input (green)                | Yes                                                                  | Yes                                                                  |
| • Monitoring 24 V voltage supply ON (green)             | Yes; (logic circuits/encoder voltage) US1                            | Yes; (logic circuits/encoder voltage) US1                            |
| <b>Environmental requirements</b>                       |                                                                      |                                                                      |
| Operating temperature                                   |                                                                      |                                                                      |
| • max.                                                  | 55 °C                                                                | 55 °C                                                                |
| <b>Degree of protection</b>                             |                                                                      |                                                                      |
| IP65                                                    | Yes                                                                  | Yes                                                                  |
| <b>Standards, approvals, certificates</b>               |                                                                      |                                                                      |
| CE mark                                                 | Yes                                                                  | Yes                                                                  |
| CSA approval                                            | Yes; ES 02 or higher                                                 | Yes                                                                  |
| UL approval                                             | Yes; ES 02 or higher                                                 | Yes                                                                  |
| <b>General information</b>                              |                                                                      |                                                                      |
| Housing                                                 | Die-cast aluminum                                                    | Die-cast aluminum                                                    |
| <b>Dimensions and weight</b>                            |                                                                      |                                                                      |
| Dimensions                                              |                                                                      |                                                                      |
| • Width                                                 | 54 mm                                                                | 54 mm                                                                |
| • Height                                                | 55 mm; 64 mm incl. overall plug height                               | 55 mm; 64 mm incl. overall plug height                               |
| • Depth                                                 | 150 mm                                                               | 150 mm                                                               |
| • Length                                                | 150 mm                                                               | 150 mm                                                               |
| Weight                                                  |                                                                      |                                                                      |
| • Weight, approx.                                       | 780 g                                                                | 780 g                                                                |

# SIMATIC ET 200 distributed I/O

## ET 200R

### ET 200R

| Ordering data                                                                                                                        | Order No.                                                                                                                          |                                                                                                                                                                                                                                                                                        | Order No.                  |
|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>ET 200R handling module IP65</b><br>Metal casing 8 DI + 8 DI/DO, configurable; 24 V DC, 5-pole, 8 x M12, 2 x M23 (DP, PS, analog) | <b>6ES7 143-2BH00-0AB0</b>                                                                                                         | <b>S7 Manual Collection</b><br>Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication) | <b>6ES7 998-8XC01-8YE0</b> |
| <b>ET 200R welding module IP65</b><br>Metal casing 8 DI + 8 DI/DO, configurable; 24 V DC, 5-pole, 8 x M12, 2 x M23 (DP, PS, analog)  | <b>6ES7 143-2BH50-0AB0</b>                                                                                                         |                                                                                                                                                                                                                                                                                        |                            |
| <b>Accessories</b>                                                                                                                   |                                                                                                                                    |                                                                                                                                                                                                                                                                                        |                            |
| <b>Cables ELOCAB</b>                                                                                                                 | Order from:<br>ELOCAB Sonderkabel<br>Obere Lerch 34<br>D-91166 Georgensmünd<br>Tel.: (+49 91 72) 69 80-0<br>Fax: (+49 91 72) 20 29 | <b>S7 Manual Collection update service for 1 year</b><br>Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates                                                                                                                                        | <b>6ES7 998-8XC01-8YE2</b> |
| <b>M23 Connector Interconnectron</b>                                                                                                 | Order from:<br>Hypertac GmbH<br>Auwiesenstr. 5, Postfach 14 65<br>D-94454 Deggendorf                                               |                                                                                                                                                                                                                                                                                        |                            |

D: Subject to export regulations AL: N and ECCN: 5D992

I: Subject to export regulations AL: N and ECCN: EAR99H

J: Subject to export regulations AL: N and ECCN: EAR99S

# Distributed I/O SIMATIC ET 200

## PROFIBUS components

### Power Rail Booster

#### Overview



- The device for low-cost PROFIBUS DP transfer over contact conductors and slip rings to degree of protection IP20
- Permissible baud rates from 9600 bit/s to 500 kbit/s, self-optimizing
- Permissible busbar length:  
From 25 m at 500 kbit/s to 1200 m at 9600 bit/s
- Configuring with PRB Checker software
- Up to 125 nodes per segment
- Transparent for data communication:  
The power rail booster does not reserve DP addresses
- Easy to install due to connection without terminating resistor and filter element
- Diagnostics LED for power supply, bus activity and group errors
- Isolated electronic changeover contact for external group error display or diagnostic alarm
- Uninterruptible communication beyond segment limits using the "PRB segment controller"

#### Technical specifications

|                                              |                            |
|----------------------------------------------|----------------------------|
| Degree of protection                         | IP20                       |
| Dimensions (W x H x D, with connector) in mm | 90 x 132 x 75              |
| Supply voltage                               | 24 V DC                    |
| Power consumption                            | max. 20 W                  |
| Data transmission rate, max.                 | 500 kbit/s, self-adjusting |
| Cable length (depends on baud rate), max.    | 1200 m                     |
| Shock-hazard protected voltage               | Yes, to EN 61131-2         |
| Stations per PRB segment, max.               | 125                        |
| Operation without terminating resistance     | Yes                        |
| Operation without filter                     | Yes                        |
| Wiring options: Line / star                  | Yes / Yes                  |

#### Ordering data

#### Order No.

|                                                                                    |                            |
|------------------------------------------------------------------------------------|----------------------------|
| <b>Power Rail Booster</b>                                                          | <b>6ES7 972-4AA02-0XA0</b> |
| Signal amplifier for PROFIBUS DP transmission over contact cables, max. 500 kbit/s |                            |
| <b>PRB segment controller</b>                                                      | <b>6ES7 972-4AA50-0XA0</b> |
| Automatic change-over switch between PRB segments                                  |                            |

I: Subject to export regulations AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/O

## PROFIBUS components

### Diagnostic repeater for PROFIBUS DP

#### Overview



- RS 485 repeater with online line diagnostics for PROFIBUS DP
- DP standard PROFIBUS slave (DP-V1)
- Automatic determination of fault types and locations
- Data transmission rate 9.6 kbit/s to 12 Mbit/s
- Connection through FastConnect using the insulation displacement method

#### Technical specifications

| 6ES7 972-0AB01-0XA0                   |                                                                  |
|---------------------------------------|------------------------------------------------------------------|
| <b>Supply voltages</b>                |                                                                  |
| Rated value                           | Yes                                                              |
| • 24 V DC                             | 20.4 V                                                           |
| • permissible range, lower limit (DC) | 28.8 V                                                           |
| • permissible range, upper limit (DC) |                                                                  |
| <b>Connection method</b>              |                                                                  |
| Bus cables                            | FastConnect insulation displacement, 10 clamping cycles possible |
| Power supply                          | Terminal block                                                   |
| <b>PROFIBUS DP</b>                    |                                                                  |
| Transmission rate, max.               | 12 Mbit/s; 9.6 Kbit/s to 12 Mbit/s                               |
| <b>Environmental requirements</b>     |                                                                  |
| Operating temperature                 |                                                                  |
| • Min.                                | 0 °C                                                             |
| • Max.                                | 60 °C                                                            |
| Storage/transport temperature         |                                                                  |
| • Min.                                | -40 °C                                                           |
| • Max.                                | 70 °C                                                            |
| Relative humidity                     |                                                                  |
| • Operation, max.                     | 95 %; at 25 °C                                                   |
| <b>Degree of protection</b>           |                                                                  |
| IP20                                  | Yes                                                              |
| <b>Dimensions and weight</b>          |                                                                  |
| Dimensions                            |                                                                  |
| • Width                               | 80 mm                                                            |
| • Height                              | 125 mm                                                           |
| • Depth                               | 67.5 mm                                                          |
| Weight                                |                                                                  |
| • Weight, approx.                     | 300 g                                                            |

# SIMATIC ET 200 distributed I/O

## PROFIBUS components

### Diagnostic repeater for PROFIBUS DP

| Ordering data                                                                                                                                                                                                                                                  | Order No.                                                |                                                                                                                                                                                                                                                                                          | Order No.                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>RS 485 diagnostic repeater</b><br>For connection of 1 or 2 segments to PROFIBUS DP; with online diagnostic functions for monitoring the bus cables                                                                                                          | <b>6ES7 972-0AB01-0XA0</b>                               | <b>PROFIBUS FastConnect Stripping Tool</b><br>Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables                                                                                                                                                           | <b>6GK1 905-6AA00</b>      |
| <b>Accessories</b>                                                                                                                                                                                                                                             |                                                          | <b>PROFIBUS FC Standard Cable</b><br>Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m                                                                                                   | <b>6XV1 830-0EH10</b>      |
| <b>RS 485 bus connector with 90° cable outlet</b><br>With screw terminals<br>Max. transfer rate 12 Mbit/s <ul style="list-style-type: none"> <li>• Without PG interface</li> <li>• With PG interface</li> </ul>                                                | <b>6ES7 972-0BA12-0XA0</b><br><b>6ES7 972-0BB12-0XA0</b> | <b>S7 Manual Collection</b> J<br>Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication) | <b>6ES7 998-8XC01-8YE0</b> |
| <b>PROFIBUS FastConnect bus connector RS 485 with 90° cable outlet</b><br>With insulation displacement terminals, max. data transfer rate 12 Mbit/s<br>Without PG interface <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul>    | <b>6ES7 972-0BA52-0XA0</b><br><b>6ES7 972-0BA52-0XB0</b> | <b>S7 Manual Collection update service for 1 year</b> D<br>Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates                                                                                                                                        | <b>6ES7 998-8XC01-8YE2</b> |
| <b>RS 485 bus connector with angled cable outlet (35°)</b><br>With screw terminals, max. transfer rate 12 Mbit/s <ul style="list-style-type: none"> <li>• Without PG interface</li> <li>• With PG interface</li> </ul>                                         | <b>6ES7 972-0BA42-0XA0</b><br><b>6ES7 972-0BB42-0XA0</b> | <b>Manual for PROFIBUS networks <sup>1)</sup></b><br>Network architecture, configuration, network components, installation<br>German                                                                                                                                                     | <b>6GK1 970-5CA20-0AA0</b> |
| <b>PROFIBUS FastConnect RS 485 bus connector with angular cable outlet (35°)</b><br>With insulation displacement terminals, max. transfer rate 12 Mbit/s <ul style="list-style-type: none"> <li>• Without PG interface</li> <li>• With PG interface</li> </ul> | <b>6ES7 972-0BA60-0XA0</b><br><b>6ES7 972-0BB60-0XA0</b> | <b>BT 200 Hardware Tester</b><br>with point-to-point cable for station testing, with test connector for wiring test, without charging unit, with operating instructions in German/English/French                                                                                         | <b>6ES7 181-0AA01-0AA0</b> |
|                                                                                                                                                                                                                                                                |                                                          | <b>Connecting cable for PROFIBUS</b><br>12 Mbit/s, for PG connection to PROFIBUS DP, preassembled with 2 x 9-pin sub D connector, 3.0 m                                                                                                                                                  | <b>6ES7 901-4BD00-0XA0</b> |

<sup>1)</sup> Further language variants and manuals can be found for the respective products at: [www.siemens.com/automation/csi/net](http://www.siemens.com/automation/csi/net)

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

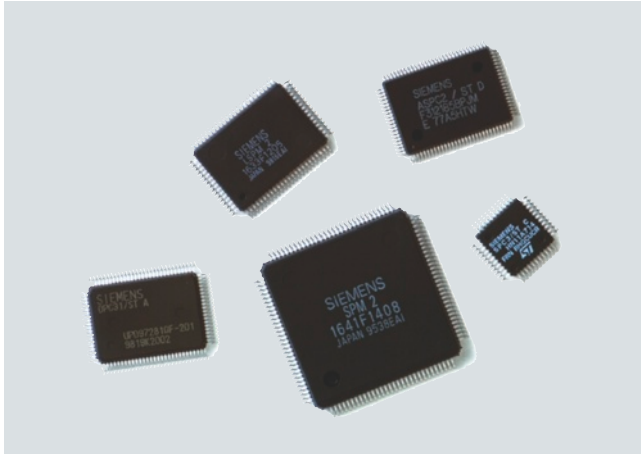


# SIMATIC ET 200 distributed I/O

## PROFIBUS components

### PROFIBUS DP ASICs

#### Overview



- Easy connection of field devices to PROFIBUS
- Integrated low power management
- Different ASICs for the different functional requirements and application areas

#### Technical specifications

|                                              | <b>LSPM 2</b>            | <b>SPC 3</b>                  | <b>SPC 3LV</b>                | <b>DPC 31</b>                                         |
|----------------------------------------------|--------------------------|-------------------------------|-------------------------------|-------------------------------------------------------|
| Protocol                                     | PROFIBUS DP              | PROFIBUS DP                   | PROFIBUS DP                   | PROFIBUS DP, PROFIBUS PA                              |
| Application range                            | simple slave application | intelligent slave application | intelligent slave application | intelligent slave application                         |
| Transmission rate, max.                      | 12 Mbit/s                | 12 Mbit/s                     | 12 Mbit/s                     | 12 Mbit/s                                             |
| Bus access                                   | in ASIC                  | in ASIC                       | in ASIC                       | in ASIC                                               |
| Automatic determination of transmission rate | yes                      | yes                           | yes                           | yes                                                   |
| Microprocessor required                      | no                       | yes                           | yes                           | integrated                                            |
| Scope of firmware                            | not required             | 6 to 24 KB                    | 6 to 24 KB                    | approx. 38 KB                                         |
| Message buffer                               | -                        | 1.5 KB                        | 1.5 KB                        | 6 KB                                                  |
| Power supply                                 | 5 V DC                   | 5 V DC                        | 3.3 V DC                      | 3.3 V DC                                              |
| Power loss, max.                             | 0.35 W                   | 0.5 W                         | <0.5 W                        | 0.2 W                                                 |
| Permissible ambient temperature              | -40 °C ... +75 °C        | -40 °C ... +85 °C             | -40 °C ... +85 °C             | -40 °C ... +85 °C                                     |
| Housing                                      | MQFP, 80-pin             | PQFP, 44-pin                  | PQFP, 44-pin                  | PQFP, 100-pin                                         |
| Frame size                                   | 4 cm <sup>2</sup>        | 2 cm <sup>2</sup>             | 2 cm <sup>2</sup>             | 4 cm <sup>2</sup>                                     |
| Delivery quantities (pcs.)                   | 6/66/330/4950            | 6/96/750/960/4800             | 5/160/800/1000/4800           | STEP B:<br>6/60/300/5100<br>STEP C1:<br>6/66/660/4620 |

|                                              | <b>SPC 4-2</b>                             | <b>ASPC 2</b>                           | <b>SIM 1-2</b>    | <b>FOCSI</b>           |
|----------------------------------------------|--------------------------------------------|-----------------------------------------|-------------------|------------------------|
| Protocol                                     | PROFIBUS DP<br>PROFIBUS FMS<br>PROFIBUS PA | PROFIBUS DP PROFIBUS<br>FMS PROFIBUS PA | PROFIBUS PA       | -                      |
| Application range                            | Intelligent slave application              | Master application                      | Medium Attachment | Medium Management Unit |
| Transmission rate, max.                      | 12 Mbit/s                                  | 12 Mbit/s                               | 31.25 kbit/s      | 12 Mbit/s              |
| Bus access                                   | in ASIC                                    | in ASIC                                 | -                 | -                      |
| Automatic determination of transmission rate | yes                                        | yes                                     | -                 | -                      |
| Microprocessor required                      | yes                                        | yes                                     | -                 | -                      |

# SIMATIC ET 200 distributed I/O

## PROFIBUS components

### PROFIBUS DP ASICs

#### Technical specifications (continued)

|                                 | SPC 4-2                        | ASPC 2            | SIM 1-2            | FOCSI             |
|---------------------------------|--------------------------------|-------------------|--------------------|-------------------|
| Scope of firmware               | 3 ... 30 KB                    | 80 KB             | not required       | not required      |
| Message buffer                  | 3 KB                           | 1 MB (external)   | -                  | -                 |
| Voltage supply                  | 5 V DC, 3.3 V                  | 5 V DC            | via bus            | 3.3 V DC          |
| Power loss, max.                | 0.6 W at 5V<br>0.01 W at 3.3 V | 0.9 W             | 0.05 W             | 0.75 W            |
| Permissible ambient temperature | -40 °C ... +85 °C              | -40 °C ... +85 °C | -40 °C ... +85 °C  | -40 °C ... +85 °C |
| Housing                         | TQFP, 44-pin                   | P-MQFP, 100-pin   | MLPQ, 40-pin       | TQFP, 44-pin      |
| Frame size                      | 2 cm <sup>2</sup>              | 4 cm <sup>2</sup> | 36 mm <sup>2</sup> | 2 cm <sup>2</sup> |
| Delivery quantities (pcs.)      | 5/160                          | 6/66/660/4620     | 30/60/1000         | 40                |

#### Ordering data

| Order No.                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Order No.                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ASIC ASPC 2</b><br>For constructing master interfaces (quantity discount) <ul style="list-style-type: none"> <li>• 6 units (lead-free)   <b>6ES7 195-0AA05-0XA0</b></li> <li>• 66 units (lead-free)   <b>6ES7 195-0AA15-0XA0</b></li> <li>• 660 units (lead-free)   <b>6ES7 195-0AA25-0XA0</b></li> <li>• 4620 units (lead-free)   <b>6ES7 195-0AA35-0XA0</b></li> </ul>                                                                                         | <b>ASIC DPC 31 STEP B</b><br>For constructing intelligent DP slave interfaces (quantity discounts) <ul style="list-style-type: none"> <li>• 6 units (lead-free)   <b>6ES7 195-0BE02-0XA0</b></li> <li>• 60 units (lead-free)   <b>6ES7 195-0BE12-0XA0</b></li> <li>• 300 units (lead-free)   <b>6ES7 195-0BE22-0XA0</b></li> <li>• 5100 units (lead-free)   <b>6ES7 195-0BE32-0XA0</b></li> </ul>                    |
| <b>ASIC LSPM 2</b><br>For constructing simple slave interfaces (quantity discount) <ul style="list-style-type: none"> <li>• 6 units (lead-free)   <b>6ES7 195-0BA02-0XA0</b></li> <li>• 66 units (lead-free)   <b>6ES7 195-0BA12-0XA0</b></li> <li>• 330 units (lead-free)   <b>6ES7 195-0BA22-0XA0</b></li> <li>• 4950 units (lead-free)   <b>6ES7 195-0BA32-0XA0</b></li> </ul>                                                                                   | <b>ASIC DPC 31 STEP C1</b><br>For constructing intelligent DP slave interfaces (quantity discounts) <ul style="list-style-type: none"> <li>• 6 units (lead-free)   <b>6ES7 195-0BF02-0XA0</b></li> <li>• 66 units (lead-free)   <b>6ES7 195-0BF12-0XA0</b></li> <li>• 660 units (lead-free)   <b>6ES7 195-0BF22-0XA0</b></li> <li>• 4620 units (lead-free)   <b>6ES7 195-0BF32-0XA0</b></li> </ul>                   |
| <b>ASIC SPC 3</b><br>For constructing intelligent DP slave interfaces (quantity discounts) <ul style="list-style-type: none"> <li>• 6 units (lead-free)   <b>6ES7 195-0BD04-0XA0</b></li> <li>• 96 units (lead-free)   <b>6ES7 195-0BD14-0XA0</b></li> <li>• 960 units (lead-free)   <b>6ES7 195-0BD24-0XA0</b></li> <li>• 4800 units (lead-free)   <b>6ES7 195-0BD34-0XA0</b></li> <li>• 750 units (lead-free) T&amp;R   <b>6ES7 195-0BD44-0XA0</b></li> </ul>     | <b>ASIC SPC 4-2</b><br>For constructing intelligent DP slave interfaces (quantity discounts) <ul style="list-style-type: none"> <li>• 5 units for laboratory development (lead-free)   <b>6GK1 588-3AA00</b></li> <li>• 160 units (lead-free, 1 tray)   <b>6GK1 588-3AA15</b></li> </ul>                                                                                                                             |
| <b>ASIC SPC 3LV</b><br>For constructing intelligent DP slave interfaces (quantity discounts) <ul style="list-style-type: none"> <li>• 5 units (lead-free)   <b>6ES7 195-0BG00-0XA0</b></li> <li>• 160 units (lead-free)   <b>6ES7 195-0BG10-0XA0</b></li> <li>• 800 units (lead-free)   <b>6ES7 195-0BG20-0XA0</b></li> <li>• 4800 units (lead-free)   <b>6ES7 195-0BG30-0XA0</b></li> <li>• 1000 units (lead-free) T&amp;R   <b>6ES7 195-0BG40-0XA0</b></li> </ul> | <b>ASIC SIM 1-2</b><br>For connection according to IEC H1 for PROFIBUS PA with a transmission rate of 31.25 kbit/s <ul style="list-style-type: none"> <li>• 60 units (in tube)   <b>6GK1 588-3BB02</b></li> <li>• 1000 units (tape &amp; reel)   <b>6GK1 588-3BB21</b></li> </ul>                                                                                                                                    |
| <b>ASIC FOCSI</b><br>Fiber Optic Controller from Siemens for conditioning signals for the optical PROFIBUS <ul style="list-style-type: none"> <li>• 40 units (lead-free)   <b>6ES7 195-0EA20-0XA0</b></li> </ul>                                                                                                                                                                                                                                                    | <b>Accessories</b><br><b>Firmware for Siemens ASIC SPC 3</b> <ul style="list-style-type: none"> <li>• DP firmware   <b>6ES7 195-2BA00-0XA0</b></li> <li>• DPV1 firmware   <b>6ES7 195-2BA01-0XA0</b></li> <li>• DPV1 firmware upgrade   <b>6ES7 195-2BA02-0XA0</b></li> </ul> <b>Firmware for Siemens ASIC DPC 31</b> <ul style="list-style-type: none"> <li>• DPV1 firmware   <b>6ES7 195-2BB00-0XA0</b></li> </ul> |

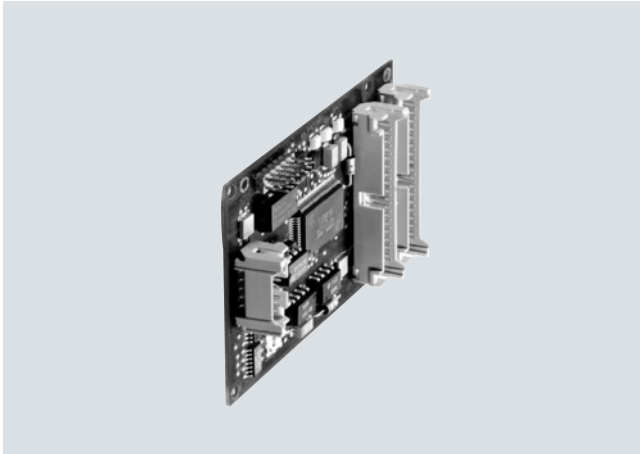
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# SIMATIC ET 200 distributed I/O

## PROFIBUS components

### Connections/interfaces

#### Overview



- PC slave board IM 182-1 for the connection of AT-compatible PCs as DP slaves

#### Technical specifications

| 6ES7 182-0AA01-0XA0                       |                                 |
|-------------------------------------------|---------------------------------|
| <b>Supply voltages</b>                    |                                 |
| Rated value                               |                                 |
| • 5 V DC                                  | Yes                             |
| <b>Current consumption</b>                |                                 |
| Current consumption, typ.                 | 250 mA                          |
| <b>Protocols</b>                          |                                 |
| PROFIBUS DP protocol                      | Yes                             |
| <b>PROFIBUS DP</b>                        |                                 |
| Transmission rate, max.                   | 12 Mbit/s                       |
| <b>Hardware components/ modules/ ASIC</b> |                                 |
| ASIC                                      | SPC 3                           |
| Scope of firmware                         | 4 to 24 KB (incl. test program) |
| <b>Programming devices</b>                |                                 |
| Microprocessor type                       | Processor of the PG/PC          |
| <b>Environmental requirements</b>         |                                 |
| Operating temperature                     |                                 |
| • Min.                                    | 0 °C                            |
| • Max.                                    | 60 °C                           |
| <b>General information</b>                |                                 |
| Application area                          | Slave applications              |
| <b>Dimensions</b>                         |                                 |
| PCB size, width                           | 168 mm                          |
| PCB size, height                          | 105 mm                          |

#### Ordering data

#### Order No.

|                                                     |                            |
|-----------------------------------------------------|----------------------------|
| <b>SIMATIC S5/S7 IM 182-1</b>                       | <b>6ES7 182-0AA01-0XA0</b> |
| <b>PC slave board</b>                               |                            |
| For PROFIBUS DP, max. 12 Mbit/s                     |                            |
| <b>Accessories</b>                                  |                            |
| <b>Windows NT driver for IM 180 and IM 182</b>      | <b>6ES7 195-2AC00-0XA0</b> |
| <b>Firmware for Siemens ASIC SPC 3 and IM 182-1</b> |                            |
| • DP firmware                                       | <b>6ES7 195-2BA00-0XA0</b> |
| • DPV1 firmware                                     | <b>6ES7 195-2BA01-0XA0</b> |
| • DPV1 firmware upgrade                             | <b>6ES7 195-2BA02-0XA0</b> |

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# SIMATIC ET 200 distributed I/O

## PROFIBUS components

### Development kits

#### Overview

##### Development kit

Using the development kits, PROFIBUS hardware and software applications can be developed and tested using the PROFIBUS ASICs DPC31.

The comprehensive, perfectly interacting hardware and software components considerably reduce the development costs for a PROFIBUS device.

The kits provide a fully functional hardware development environment which development engineers can build on with their special requirements for hardware and software. The kit documentation is supplied on CD in English and German.

The kits make our PROFIBUS know-how accessible to other users. The development team is available to provide advice to new users even with their own developments - this consultancy service is also a component part of the development kit.

Following completion of a development, devices can be certified by our experts in the PROFIBUS interface centers – we can help new users here, too.

##### PROFIBUS DP/PA development kit

The kit facilitates set up of PROFIBUS slaves with a variety of PROFIBUS standards:

- PROFIBUS DP-V1 (RS485)
- PROFIBUS PA (IEC 1158) and
- PROFIBUS based on fiber-optic cables.

The development environment shows applications implemented using PROFIBUS-ASICs DPC 31.

Hardware included:

- DPC 31 development board; for developing/testing proprietary applications
- CP 5613; serves as master interface for the PC (PCI card)
- Optical bus terminal; for conversion of copper cables to FOCs
- Pre-assembled PROFIBUS cables

Software included:

- Testing and simulation software under WinNT for use on the PC in connection with the CP 5613 master module
- Sample program for the DPC 31 board
- DPC 31 DPV1 original firmware, including developer license
- Parameterization software for CP 5613 "COM PROFIBUS" for DP operation

When developing PROFIBUS PA applications, order a PROFIBUS DP/PA coupler (6ES7 157-0AC80-0XA0) separately. The DP/PA coupler converts the PROFIBUS DP physical specifications into those of PROFIBUS PA physical. This module is not included in the development kit!

##### PROFIsafe starter kit V3.4

The PROFIsafe starter kit V3.4 is compatible with version 2.4 of the PROFIsafe profile, as specified in IEC 61784-3-3. It meets a series of user requirements such as multi-instance capability and variable process data length at runtime.

Along with all of the PI specifications required for development, the PROFIsafe starter kit contains the source files for the PROFIsafe driver software (PSD) and a comprehensive implementation manual in English and German. In addition, it includes various CRC calculation tools and tools for creating GSD files with security-related parameters.

Examples of adaptation of the PSD (PROFIsafe Driver) to current PROFIBUS and PROFINET stack interfaces provide assistance for adaptations that may be necessary. Special "slow motion monitors" allow the PROFIsafe protocol processes to be monitored in slow motion. A new feature is support for the iPar server and the TCI interface.

Example applications are provided on the CD-ROM for both PROFIBUS and PROFINET. The hardware components supplied in the development kits offer the user access to the PROFIsafe world, step-by-step.

The PROFIsafe starter kit consists of the following components:

- Current PROFIsafe specifications with current PROFIsafe certificate
- PROFIsafe driver software (as core component of the development package)
- Example GSD file for STEP7 (for PROFIBUS DP/PA development package and DK-ERTEC 200 PN IO)
- Example project for S7-319F (for PROFIBUS DP/PA development package and DK-ERTEC 200 PN IO)
- GSD tools (e.g. GSD editor and CRC calculation tool)
- iPar server software and instructions (FB24)
- Tool calling interface example and instructions
- F programming guidelines
- Layer stacks (V1SL and PN IO)
- Example firmware (for PROFIBUS DP/PA development package and DK-ERTEC 200 PN IO)
- Project for development environment example (for PROFIBUS DP/PA development package and DK-ERTEC 200 PN IO)
- Slow motion monitor (for PROFIBUS: PG-PC and CP5613, for PROFINET: PG-CP1616)
- Comprehensive documentation

#### Ordering data

#### Order No.

##### DP/PA development kit

For PROFIBUS ASIC DPC 31 and SIM1, English/German

**6ES7 195-3BA10-0YA0**

##### PROFIsafe starter kit V3.4

**6ES7 195-3BF02-0YA0**

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# SIMATIC ET 200 distributed I/O

## SIPLUS PROFIBUS components

### SIPLUS diagnostic repeater for PROFIBUS

#### Overview



- RS-485 repeater with online line diagnostics for PROFIBUS DP
- PROFIBUS DP standard slaves (DP-V1)
- Automatic determination of fault type and location
- Transmission rate from 9.6 kbit/s to 12 Mbit/s
- Connection via Fast Connect IDC

#### Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### SIPLUS diagnostic repeater for PROFIBUS DP

|                                                                              |                                                                                                                                                                                        |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Order No.                                                                    | <b>6AG1 972-0AB01-4XA0</b>                                                                                                                                                             |
| Order No. based on                                                           | <b>6ES7 972-0AB01-0AA0</b>                                                                                                                                                             |
| Ambient temperature range                                                    | 0 °C to +60 °C                                                                                                                                                                         |
| Conformal coating                                                            | Coating of the printed circuit boards and the electronic components                                                                                                                    |
| Technical data                                                               | The technical data of the standard product applies except for the ambient conditions.                                                                                                  |
| <b>Ambient conditions</b>                                                    |                                                                                                                                                                                        |
| Relative humidity                                                            | 5 ... 100 %<br>condensation permitted                                                                                                                                                  |
| Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                          |
| Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                                  |
| Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                                  |
| Air pressure (depending on the highest positive temperature range specified) | 1080...795 hPa<br>(-1000 ... +2000 m)<br>See ambient temperature range<br>795...658 hPa<br>(+2000 ... +3500 m)<br>Derating 10 K<br>658...540 hPa<br>(+3500 ... +5000m)<br>Derating 20K |

- <sup>1)</sup> ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> <4.8 ppm; H<sub>2</sub>S <9.9 ppm; Cl <0.2 ppm; HCl <0.66 ppm; HF <0.12 ppm; NH <49 ppm; O<sub>3</sub> <0.1 ppm; NOX <5.2 ppm Threshold / limit value (max. 30 min/d): SO<sub>2</sub> <17.8 ppm; H<sub>2</sub>S <49.7 ppm; Cl <1.0 ppm; HCl <3.3 ppm; HF <2.4 ppm; NH <247 ppm; O<sub>3</sub> <1.0 ppm; NOX <10.4 ppm
- <sup>2)</sup> The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

| Ordering data                                                                                          | Order No.                                          |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| <b>SIPLUS RS 485 diagnostic repeater</b>                                                               | <b>6AG1 972-0AB01-4XA0</b>                         |
| (medial exposure)                                                                                      |                                                    |
| to connect up to 2 segments to PROFIBUS DP, with on-line diagnostic functions to monitor the bus lines |                                                    |
| <b>Accessories</b>                                                                                     | See SIMATIC RS 485 diagnostic repeater, page 9/351 |

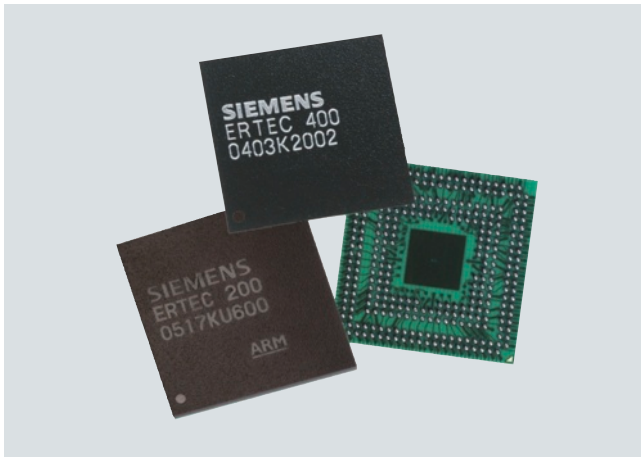
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# SIMATIC ET 200 distributed I/O

## PROFINET components

### Enhanced real-time Ethernet controller ERTEC

#### Overview



With the Industrial Ethernet ASICs of the ERTEC family (Enhanced Real-Time Ethernet Controller), devices and systems can be connected to PROFINET without great effort. The high-performance Ethernet controllers with 32-bit microprocessor as well as integral real-time switch for Real Time Ethernet have been specially developed for industrial use.

These Ethernet controllers handle all the data transmission for PROFINET IO in real time (RT) and isochronous real time (IRT) and thus offload the application processor. Thanks to the integral 2-port switch (ERTEC 200) or 4-port switch (ERTEC 400), there are no costs for external switches. Flexible topologies such as star, tree and linear topologies can be implemented without any other external network components.

- **ERTEC 200**  
with an integral 2-port switch for developing simple or modular PROFINET field devices. It also contains integral PHYs for linking the Ethernet controllers to the physical communication network.
- **ERTEC 400**  
with 4 integral ports and one integral PCI interface for developing controllers and network components.

The DK-ERTEC 200 PN IO and DK-ERTEC 400 PN IO Development Kits enable the uncomplicated development of PROFINET field devices thanks to fast and simple integration of the PROFINET IO functionalities based on the ERTEC. The ERTEC 200 PN IO Starter Kit is especially suitable for low-cost introduction to PROFINET field device development.

#### Technical specifications

|                                                   | ERTEC 400                                                                                                                                                                                                                                                                         | ERTEC 200                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transmission rate                                 | 10/100 Mbit/s                                                                                                                                                                                                                                                                     | 10/100 Mbit/s                                                                                                                                                                                                                                                                                                                           |
| Interfaces                                        |                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                         |
| • Ethernet / PHY interface                        | 4 x PHY interface <ul style="list-style-type: none"> <li>• Half/full duplex</li> <li>• Broadcast filter</li> <li>• IEEE 802.1 p Traffic Management</li> <li>• IEEE 802.1 q VLAN Tagging and Identification</li> <li>• IEEE 1588</li> </ul>                                        | 2 x Ethernet interface (PHY integrated) or alternatively<br>2 x PHY interface (for connection of optical PHYs) <ul style="list-style-type: none"> <li>• Half/full duplex</li> <li>• Broadcast filter</li> <li>• IEEE 802.1 p Traffic Management</li> <li>• IEEE 802.1 q VLAN Tagging and Identification</li> <li>• IEEE 1588</li> </ul> |
| - In connection with the corresponding PHY types: | Support for copper and fiber-optic cables; autosenesing; autocrossover                                                                                                                                                                                                            | Support for copper and fiber-optic cables (PHY for copper integrated); autosenesing; autocrossover                                                                                                                                                                                                                                      |
| • Local Bus Unit (LBU)                            | Local bus master interface for connecting an external host with access to internal areas of the ERTEC;<br>16 bit data bit width<br>32 bit, 33/66 MHz                                                                                                                              | Local bus master interface for connecting an external host with access to internal areas of the ERTEC;<br>16 bit data bit width                                                                                                                                                                                                         |
| • PCI interface                                   | <ul style="list-style-type: none"> <li>• Host functionality</li> <li>• 2 PCI interrupt outputs INTA_N and SERR_N</li> <li>• Power Management V1.1</li> <li>• 3.3 V (5 V tolerance)</li> <li>• PCI master/target interface</li> <li>• PCI Core compatible PCI spec. 2.2</li> </ul> | <ul style="list-style-type: none"> <li>–</li> <li>–</li> <li>–</li> <li>–</li> <li>–</li> <li>–</li> </ul>                                                                                                                                                                                                                              |
| • External memory interface (EMIF)                |                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                         |
| - SDRAM controller                                | 128 MB/16 bit or 256 MB/32 bit                                                                                                                                                                                                                                                    | 64 MB/16 bit or 128 MB/32 bit                                                                                                                                                                                                                                                                                                           |
| - SRAM controller                                 | 4 x 16 MB for asynchronous blocks (SRAM, flash, I/O 8/16/32 bit)                                                                                                                                                                                                                  | 4 x 16 MB for asynchronous blocks (SRAM, flash, I/O 8/16/32 bit)                                                                                                                                                                                                                                                                        |
| - Chip-select support                             | yes                                                                                                                                                                                                                                                                               | yes                                                                                                                                                                                                                                                                                                                                     |
| • IO interfaces                                   | 32 parameterizable I/O (GPIO); multifunctional outputs                                                                                                                                                                                                                            | 45 parameterizable I/O (GPIO) multifunctional outputs                                                                                                                                                                                                                                                                                   |

# SIMATIC ET 200 distributed I/O

## PROFINET components

### Enhanced real-time Ethernet controller ERTEC

#### Technical specifications (continued)

|                                                                                                                                                                                                                                                      | ERTEC 400                                                                                                                                              | ERTEC 200                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function units                                                                                                                                                                                                                                       |                                                                                                                                                        |                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>Real-time Ethernet switch</li> </ul>                                                                                                                                                                          | Integral 4-port Fast Ethernet/Real-Time Ethernet switch;<br>10/100 Mbit Ethernet full duplex<br>192 KB                                                 | Integral 2-port Fast Ethernet/Real-Time Ethernet switch;<br>10/100 Mbit Ethernet full duplex<br>64 KB                                                  |
| <ul style="list-style-type: none"> <li>Communication RAM (SRAM on chip for message frame buffering)</li> <li>Intelligent switching and PROFINET IRT prioritization/timing</li> </ul>                                                                 | yes                                                                                                                                                    | yes                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>Integral ARM946 processor</li> <li>Adjustable operating frequency</li> <li>Data cache</li> <li>Instruction cache</li> <li>D-TCM</li> <li>Memory Protection Unit (MPU)</li> <li>Trace functionality</li> </ul> | 32-bit ARM system<br>50/100/150 MHz<br>4 KB<br>8 KB<br>4 KB<br>yes<br>Debug capability due to embedded ICE (JTAG)                                      | 32-bit ARM system<br>50/100/150 MHz<br>4 KB<br>8 KB<br>4 KB<br>yes<br>Debug capability due to embedded ICE (JTAG)                                      |
| <ul style="list-style-type: none"> <li>Interrupt controller</li> </ul>                                                                                                                                                                               | For 16xIRQ/ 8xFIQ                                                                                                                                      | For 16xIRQ/ 8xFIQ                                                                                                                                      |
| <ul style="list-style-type: none"> <li>Processor I/O</li> <li>SPI master interface</li> <li>Timer 32 bit down-counter</li> <li>F timer 32 bit down-counter</li> <li>Watchdog functions</li> <li>External interrupt inputs</li> </ul>                 | 2 UART similar to the standard UART 16C550<br>yes<br>2<br>yes<br>2<br>yes                                                                              | 1 UART similar to the standard UART 16C550<br>yes<br>3<br>yes<br>3<br>yes                                                                              |
| <ul style="list-style-type: none"> <li>Internal bus structure</li> </ul>                                                                                                                                                                             | 32 bit (multi-layer AHB) with 50 MHz clock frequency;<br>multi-layer architecture with parallel access structure of several multimasters to multislave | 32 bit (multi-layer AHB) with 50 MHz clock frequency;<br>multi-layer architecture with parallel access structure of several multimasters to multislave |
| <ul style="list-style-type: none"> <li>SRAM-integral work memory on AHB</li> <li>Size</li> <li>Program/data memory</li> <li>Multiport RAM</li> </ul>                                                                                                 | 8 KB<br>ARM 946<br>For ARM946, IRT and PCI                                                                                                             | –<br>–<br>–                                                                                                                                            |
| <ul style="list-style-type: none"> <li>Clock cycle generation</li> </ul>                                                                                                                                                                             | Internal through PLL for ARM 946ES, AHB, APB and IRT                                                                                                   | Internal through PLL for ARM 946ES, AHB, APB and IRT                                                                                                   |
| <ul style="list-style-type: none"> <li>Boot ROM</li> </ul>                                                                                                                                                                                           | With opcode for software download from different download sources                                                                                      | With opcode for software download from different download sources                                                                                      |
| <ul style="list-style-type: none"> <li>Test functions</li> </ul>                                                                                                                                                                                     | Boundary scan                                                                                                                                          | Boundary scan                                                                                                                                          |
| Supply voltage                                                                                                                                                                                                                                       |                                                                                                                                                        |                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>Core (VDD Core)</li> <li>I/Os (VDD IO)</li> </ul>                                                                                                                                                             | 1.5 V +/- 10 %<br>3.3 V +/- 10 %                                                                                                                       | 1.5 V +/- 10 %<br>3.3 V +/- 10 %                                                                                                                       |
| Current input                                                                                                                                                                                                                                        |                                                                                                                                                        |                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>IDC core</li> <li>IDC IO</li> </ul>                                                                                                                                                                           | Typ. 270 mA<br>Typ. 150 mA                                                                                                                             | Typ. 535 mA<br>Typ. 175 mA                                                                                                                             |
| Power loss                                                                                                                                                                                                                                           |                                                                                                                                                        |                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>PDC core</li> <li>PDC IO</li> </ul>                                                                                                                                                                           | Typ. 0.4 W<br>Typ. 0.5 W                                                                                                                               | Typ. 0.8 W<br>Typ. 0.57 W                                                                                                                              |
| Perm. ambient conditions                                                                                                                                                                                                                             |                                                                                                                                                        |                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>Operating temperature</li> <li>Transport/storage temperature</li> <li>Relative humidity</li> </ul>                                                                                                            | -40 °C to +85 °C<br>-40 °C to +85 °C<br>Max. 95 % at +25 °C                                                                                            | -40 °C to +85 °C<br>-40 °C to +85 °C<br>Max. 95 % at +25 °C                                                                                            |
| Constructional design                                                                                                                                                                                                                                |                                                                                                                                                        |                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>Housing</li> <li>Pinning Ball Pitch</li> </ul>                                                                                                                                                                | Plastic FBGA 304 Pin<br>0.8 mm                                                                                                                         | Plastic FBGA 304 Pin<br>0.8 mm                                                                                                                         |
| Dimensions (W x H x D) in mm                                                                                                                                                                                                                         | 19 x 1 x 19                                                                                                                                            | 19 x 1 x 19                                                                                                                                            |
| - ERTEC                                                                                                                                                                                                                                              |                                                                                                                                                        |                                                                                                                                                        |
| Supported communication protocols                                                                                                                                                                                                                    |                                                                                                                                                        |                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>General Ethernet protocols</li> </ul>                                                                                                                                                                         | In accordance with the respective software implementation that uses the ERTEC as Ethernet controller                                                   | In accordance with the respective software implementation that uses the ERTEC as Ethernet controller                                                   |
| <ul style="list-style-type: none"> <li>PROFINET in combination with a PROFINET Software Stack</li> </ul>                                                                                                                                             | Real-Time communication (RT);<br>Isochronous Real-Time communication (IRT)                                                                             | Real-Time communication (RT);<br>Isochronous Real-Time communication (IRT)                                                                             |



# SIMATIC ET 200 distributed I/O

## PROFINET components

### Enhanced real-time Ethernet controller ERTEC

| Ordering data                                                                                                                                                                                                                                                                                                                                  | Order No.                                                |  | Order No.                                                                                                                                                                                                                                                                                      |                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <b>ERTEC 400 (lead-free)</b><br><br>ASIC ERTEC 400 for connection to switched Ethernet 10/100 Mbit/s, Ethernet controller with integrated 4-port switch, ARM 946 RISC and PCI interface (V2.2), data preparation for real-time and isochrone real-time for PROFINET IO<br><br>• 70 units (individual tray),<br>• 350 units (drypack, 5 trays), | <b>6GK1 184-0BB01-0AA1</b><br><b>6GK1 184-0BB01-0AA2</b> |  | <b>ERTEC 200 (lead-free)</b><br><br>ASIC ERTEC 200 for connection to switched Ethernet 10/100 Mbit/s, Ethernet controller with integrated 2-port switch, ARM 946 processor and integrated PHYs real-time for PROFINET IO<br><br>• 70 units (individual tray)<br>• 350 units (drypack, 5 trays) | <b>6GK1 182-0BB01-0AA1</b><br><b>6GK1 182-0BB01-0AA2</b> |
| <b>DK-ERTEC 400 PN IO Development kit</b>                                                                                                                                                                                                                                                                                                      | D <b>6GK1 953-0CA00</b>                                  |  | <b>DK-ERTEC 200 PN IO Development kit</b>                                                                                                                                                                                                                                                      | D <b>6GK1 953-0BA00</b>                                  |
|                                                                                                                                                                                                                                                                                                                                                |                                                          |  | <b>ERTEC 200 PN IO Starter kit</b>                                                                                                                                                                                                                                                             | D <b>6ES7 195-3BD00-0YA0</b>                             |

D: Subject to export regulations AL: N and ECCN: 5D992



# SIMATIC ET 200 distributed I/O

## PROFINET components

### Development kit for ERTEC

#### Overview



With the help of the development kits for the Enhanced Real-Time Ethernet Controller ERTEC, compact or modular PROFINET IO field devices can be developed in a short time and without great effort.

The DK-ERTEC 200 PN IO and DK-ERTEC 400 PN IO development kits enable comprehensive implementation of the PROFINET IO functionality. The low-cost starter kit is suitable as an introduction to PROFINET technology and can later be upgraded to a full DK-ERTEC 200 PN IO.

New: Since Version 3.2, the innovative functions Shared Device, MRP and PROFIenergy have been included in the development packages and can be integrated into PROFINET IO field devices at no additional expense.

#### Ordering data

#### Order No.

##### ERTEC development kits

|                                    |   |                            |
|------------------------------------|---|----------------------------|
| DK-ERTEC 200 PN IO Development kit | D | <b>6GK1 953-0BA00</b>      |
| DK-ERTEC 400 PN IO Development kit | D | <b>6GK1 953-0CA00</b>      |
| ERTEC 200 PN IO Starter Kit        | D | <b>6ES7 195-3BD00-0YA0</b> |
| PROFIsafe starter kit V3.4         | J | <b>6ES7 195-3BF02-0YA0</b> |

##### ERTEC ASICs

##### ERTEC 200

ASIC ERTEC 200 for connection to switched Ethernet 10/100 Mbit/s, Ethernet controller with integrated 2-port switch, ARM 946 processor and integrated PHYs real-time for PROFINET IO

- 70 units (individual trays),
- 350 units (drypack, 5 trays),

**6GK1 182-0BB01-0AA1**  
**6GK1 182-0BB01-0AA2**

##### ERTEC 400

ASIC ERTEC 400 for connection to switched Ethernet 10/100 Mbit/s, Ethernet controller with integrated 4-port switch, ARM 946 RISC and PCI (V2.2), data preparation for real-time and isochronous real-time for PROFINET IO

- 70 units (individual trays),
- 350 units (drypack, 5 trays),

**6GK1 184-0BB01-0AA1**  
**6GK1 184-0BB01-0AA2**

##### Accessories

PROFINET IO product line license for one product line

**6ES7 195-3BC10-0YA0**

D: Subject to export regulations AL: N and ECCN: 5D992

J: Subject to export regulations AL: N and ECCN: EAR99S

# SIMATIC ET 200 distributed I/O

## PROFINET components

### Development kit for Standard Ethernet Controllers

#### Overview



With the help of the development kit for Standard Ethernet Controllers, PROFINET IO devices can be developed on the basis of a Standard Ethernet Controller.

| Ordering data                                                                     | Order No.             |
|-----------------------------------------------------------------------------------|-----------------------|
| <b>Development kit for Standard Ethernet Controller</b><br>for Ethernet processor | J 6ES7 195-3BC00-0YA0 |
| <b>Accessories</b><br>PROFINET IO product line license for one product line       | 6ES7 195-3BC10-0YA0   |

J: Subject to export regulations AL: N and ECCN: EAR99S

# SIMATIC ET 200 distributed I/O

## Network components for PROFIBUS

### RS 485 repeater for PROFIBUS

#### Overview



- Automatic data transmission rate search
- Data transmission rate of 45.45 Kbit/s possible
- 24 V DC voltage display
- Display bus activity segment 1 and 2
- Isolation of segment 1 and 2 possible by switch
- Isolation of the right segment part when terminating resistor is inserted
- Decoupling of segment 1 and segment 2 in the event of static interference.

#### Designed for Industry

- To increase the number of stations and the expansion
- Galvanic isolation of segments
- Startup assistance
  - switch for disconnecting segments
  - display of bus activity
  - isolation of segment with incorrectly inserted terminating resistor

Please also have a look at the diagnostic repeater which in addition to the normal repeater functionality also has comprehensive diagnostic functions for physical line diagnostics. It is described on page 9/350.

#### Technical specifications

| 6ES7 972-0AA01-0XA0                   |                                                                                                                                   |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                |                                                                                                                                   |
| Rated value                           | Yes                                                                                                                               |
| • 24 V DC                             | 20.4 V                                                                                                                            |
| • permissible range, lower limit (DC) |                                                                                                                                   |
| • permissible range, upper limit (DC) | 28.8 V                                                                                                                            |
| <b>Current consumption</b>            |                                                                                                                                   |
| Current consumption, max.             | 200 mA; (200 mA without loads at PG/OP socket; 230 mA load at PG/OP socket (5 V/90 mA); 300 mA load at PG/OP socket (24 V/90 mA)) |
| <b>Connection method</b>              |                                                                                                                                   |
| Bus cables                            | 2 terminal blocks                                                                                                                 |
| Power supply                          | Terminal block                                                                                                                    |
| <b>PROFIBUS DP</b>                    |                                                                                                                                   |
| Transmission rate, max.               | 12 Mbit/s; 9.6 Kbit/s to 12 Mbit/s                                                                                                |
| <b>Environmental requirements</b>     |                                                                                                                                   |
| Operating temperature                 |                                                                                                                                   |
| • Min.                                | 0 °C                                                                                                                              |
| • Max.                                | 60 °C                                                                                                                             |
| Storage/transport temperature         |                                                                                                                                   |
| • Min.                                | -40 °C                                                                                                                            |
| • Max.                                | 70 °C                                                                                                                             |
| Relative humidity                     |                                                                                                                                   |
| • Operation, max.                     | 95 %; at 25 °C                                                                                                                    |
| <b>Degree of protection</b>           |                                                                                                                                   |
| IP20                                  | Yes                                                                                                                               |
| <b>Dimensions and weight</b>          |                                                                                                                                   |
| Dimensions                            |                                                                                                                                   |
| • Width                               | 45 mm                                                                                                                             |
| • Height                              | 128 mm                                                                                                                            |
| • Depth                               | 67 mm                                                                                                                             |
| Weight                                |                                                                                                                                   |
| • Weight, approx.                     | 350 g                                                                                                                             |

#### Ordering data

#### Order No.

#### RS 485 Repeater for PROFIBUS

6ES7 972-0AA02-0XA0

Data transmission rate up to 12 Mbit/s 24 V DC, housing to IP20

SIMATIC ET 200 distributed I/O  
Network components for PROFIBUS

Active RS 485 terminating element

Overview



- Terminates bus segments at data transmission rates of 9.6 kbit/s to 12 Mbit/s
- Power supply independent of bus stations.

Designed for Industry

- Terminal-independent bus termination through onboard power supply

Technical specifications

| 6ES7 972-0DA00-0AA0                   |                                    |
|---------------------------------------|------------------------------------|
| <b>Supply voltages</b>                |                                    |
| Rated value                           | Yes                                |
| • 24 V DC                             | 20.4 V                             |
| • permissible range, lower limit (DC) | 28.8 V                             |
| • permissible range, upper limit (DC) |                                    |
| <b>Current consumption</b>            |                                    |
| Current consumption, typ.             | 30 mA                              |
| <b>Connection method</b>              |                                    |
| Bus cables                            | Screw terminal block               |
| Power supply                          | Screw terminal block               |
| <b>PROFIBUS DP</b>                    |                                    |
| Transmission rate, max.               | 12 Mbit/s; 9.6 Kbit/s to 12 Mbit/s |
| <b>Environmental requirements</b>     |                                    |
| Operating temperature                 |                                    |
| • Min.                                | 0 °C                               |
| • max.                                | 60 °C                              |
| Storage/transport temperature         |                                    |
| • Min.                                | -40 °C                             |
| • max.                                | 70 °C                              |
| Relative humidity                     |                                    |
| • Operation, max.                     | 95 %; at +25 °C                    |
| <b>Degree of protection</b>           |                                    |
| IP20                                  | Yes                                |
| <b>Dimensions and weight</b>          |                                    |
| Dimensions                            |                                    |
| • Width                               | 60 mm                              |
| • Height                              | 70 mm                              |
| • Depth                               | 43 mm                              |
| Weight                                |                                    |
| • Weight, approx.                     | 95 g                               |

Ordering data

Active RS 485 terminating element for PROFIBUS

For terminating bus segments for data transmission rates of 9.6 kbit/s to 12 Mbit/s

Order No.

6ES7 972-0DA00-0AA0

# SIMATIC ET 200 distributed I/O

## SIPLUS network components for PROFIBUS

### SIPLUS RS 485 repeater

#### Overview



- Automatically detects transmission rate
- 45.45 kbit/s transmission rate is possible
- 24 V DC voltage display
- Bus activity segment 1 and 2 display
- The separation of segment 1 and segment 2 on switch is possible
- Separation of the right segment with an inserted terminator
- Decoupling of segment 1 and segment 2 with static interference

#### Designed for Industry

- To increase the number of participants and the extension
- Segment electric isolation
- Commissioning support
  - Segment separation switch
  - Bus activity display
  - Segment separation with an incorrectly inserted terminator

Please also note in this context the diagnostic repeater that provides extensive diagnostic functions for physical line diagnostics in addition to the normal repeater functionality. This is described on page 9/350.

#### Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### SIPLUS Repeater RS-485 for PROFIBUS

|                                                                              |                                                                                                                                                                               |                     |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Order No.                                                                    | 6AG1 972-0AA01-4XA0                                                                                                                                                           | 6AG1 972-0AA01-7XA0 |
| Order No. based on                                                           | 6ES7 972-0AA01-0XA0                                                                                                                                                           | 6ES7 972-0AA01-0XA0 |
| Ambient temperature range                                                    | 0 °C to +60 °C                                                                                                                                                                | -25 °C to +70 °C    |
| Conformal coating                                                            | Coating of the printed circuit boards and the electronic components                                                                                                           |                     |
| Technical data                                                               | The technical data of the standard product applies except for the ambient conditions.                                                                                         |                     |
| Ambient conditions                                                           |                                                                                                                                                                               |                     |
| Relative humidity                                                            | 5 ... 100 %<br>condensation permitted                                                                                                                                         |                     |
| Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                 |                     |
| Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                         |                     |
| Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>                                                                                         |                     |
| Air pressure (depending on the highest positive temperature range specified) | 1080...795 hPa (-1000 ... +2000 m)<br>See ambient temperature range<br>795...658 hPa (+2000 ... +3500 m)<br>Derating 10 K<br>658...540 hPa (+3500 ... +5000m)<br>Derating 20K |                     |

- <sup>1)</sup> ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> <4.8 ppm; H<sub>2</sub>S <9.9 ppm; Cl <0.2 ppm; HCl <0.66 ppm; HF <0.12 ppm; NH<sub>3</sub> <49 ppm; O<sub>3</sub> <0.1 ppm; NOX <5.2 ppm Threshold / limit value (max. 30 min/d): SO<sub>2</sub> <17.8 ppm; H<sub>2</sub>S <49.7 ppm; Cl <1.0 ppm; HCl <3.3 ppm; HF <2.4 ppm; NH<sub>3</sub> <247 ppm; O<sub>3</sub> <1.0 ppm; NOX <10.4 ppm
- <sup>2)</sup> The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

#### Ordering data

#### Order No.

#### SIPLUS RS 485 repeater for PROFIBUS

(media exposure)

Transfer rate up to max. 12 Mbit/s, L  
24 V DC, housing IP20

**6AG1 972-0AA01-4XA0**

Additionally with extended  
ambient temperature range  
-25 °C ... +70 °C

**6AG1 972-0AA01-7XA0**

L: Subject to export regulations AL: 91999 and ECCN: N

# SIMATIC ET 200 distributed I/O

## SIPLUS network components for PROFIBUS

### SIPLUS DP active RS485 terminating element

#### Overview



- Used to complete bus segments at rates of 9.6 kbit/s to 12 Mbit/s
- Power supply independent of the bus participants.

#### Designed for Industry

- End-device independent bus termination due to own power supply

#### Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### SIPLUS active RS-485 terminating element

|                                                                              |                                                                                                                                                                                        |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Order No.                                                                    | 6AG1 972-0DA00-2AA0                                                                                                                                                                    |
| Order No. based on                                                           | 6ES7 972-0DA00-0AA0                                                                                                                                                                    |
| Ambient temperature range                                                    | -25 °C to +60 °C                                                                                                                                                                       |
| Conformal coating                                                            | Coating of the printed circuit boards and the electronic components                                                                                                                    |
| Technical data                                                               | The technical data of the standard product applies except for the ambient conditions.                                                                                                  |
| <b>Ambient conditions</b>                                                    |                                                                                                                                                                                        |
| Relative humidity                                                            | 5 ... 100 %<br>condensation permitted                                                                                                                                                  |
| Biologically active substances                                               | Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)                                                                                                          |
| Chemically active substances                                                 | Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA -S71.04 severity level G1; G2; G3; GX <sup>1) 2)</sup>                                                                 |
| Mechanically active substances                                               | Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust 2)                                                                                                             |
| Air pressure (depending on the highest positive temperature range specified) | 1080...795 hPa<br>(-1000 ... +2000 m)<br>See ambient temperature range<br>795...658 hPa<br>(+2000 ... +3500 m)<br>Derating 10 K<br>658...540 hPa<br>(+3500 ... +5000m)<br>Derating 20K |

- 1) ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> <4.8 ppm; H<sub>2</sub>S <9.9 ppm; Cl <0.2 ppm; HCl <0.66 ppm; HF <0.12 ppm; NH <49 ppm; O<sub>3</sub> <0.1 ppm; NOX <5.2 ppm Threshold / limit value (max. 30 min/d): SO<sub>2</sub> <17.8 ppm; H<sub>2</sub>S <49.7 ppm; Cl <1.0 ppm; HCl <3.3 ppm; HF <2.4 ppm; NH <247 ppm; O<sub>3</sub> <1.0 ppm; NOX <10.4 ppm
- 2) The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

The technical documentation on SIPLUS can be found here:

[www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

| Ordering data                                                              | Order No.                  |
|----------------------------------------------------------------------------|----------------------------|
| <b>SIPLUS DP active RS 485 terminating element for PROFIBUS</b>            | <b>6AG1 972-0DA00-2AA0</b> |
| (extended temperature range and medial exposure)                           |                            |
| to complete bus segments for transmission rates of 9.6 kbit/s to 12 Mbit/s |                            |

L: Subject to export regulations AL: 91999 and ECCN: N

# SIMATIC ET 200 distributed I/O

## Network transitions

### PN/PN coupler

#### Overview



- Data exchange of max. 256-byte input data and 256-byte output data between two PROFINET networks
- Maximum of 16 input/output ranges for the exchange of data
- Electrical isolation between the two PROFINET IO subnets
- Redundant power supply
- Supported Ethernet services
  - ping
  - arp
  - network diagnostics (SNMP/MIB-2)
- Diagnostic interrupts
- ReturnOf Submodule interrupts

#### Ordering data

#### Order No.

##### PN/PN coupler

for connecting two PROFINET networks

**6ES7158-3AD01-0XA0**

##### Power supply connector

Spare part;  
for connecting the 24 V DC supply voltage

- with push-in terminals
- with screw-type terminals

**6ES7 193-4JB00-0AA0**  
**6ES7 193-4JB50-0AA0**

# SIMATIC ET 200 distributed I/O

## Network transitions

### DP/DP coupler

#### Overview



- Interconnecting two PROFIBUS DP networks
- The interchange of data between both DP networks takes place by internal copying in the coupler.

#### Technical specifications

##### DP/DP transceiver

|                                 |                              |
|---------------------------------|------------------------------|
| PROFIBUS transmission rate      | max. 12 Mbit/s               |
| Interfaces                      |                              |
| • PROFIBUS DP                   | 9-pin Sub-D connector        |
| Supply voltage                  | 24 V DC                      |
| Current consumption typ.        | 150 mA                       |
| Mounting                        | Upright (DIP switches above) |
| Perm. ambient conditions        |                              |
| • Operating temperature         |                              |
| - horizontal mounting           | 0°C ... +60°C                |
| - all other mounting positions  | 0°C ... +40°C                |
| • Transport/storage temperature | -40 °C ... +70 °C            |
| • Relative humidity             | 10-95 % at +25 °C            |
| Design                          |                              |
| • Dimensions (W x H x D) in mm  | 40 x 127 x 117               |
| • Weight                        | approx. 250 g                |
| Degree of protection            | IP20                         |

#### Ordering data

#### Order No.

##### DP/DP coupler

**6ES7 158-0AD01-0XA0**

Note:

The manual is available on the Internet free of charge.



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