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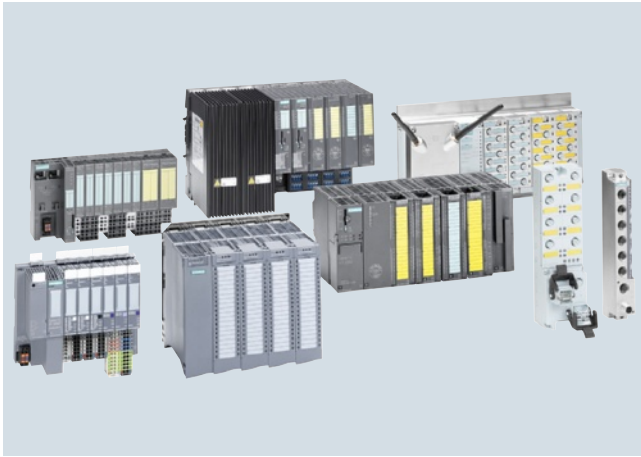
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I/O systems

Introduction

I/O systems

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

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.

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).

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.

IO-Link

The communication standard IO-Link permits the intelligent connection of sensors and switching devices to the control level. IO-Link facilitates the integration of all components in the control cabinet and on the field level - for maximum integration and seamless communication on the final meters to the process.

IO-Link solutions from Siemens ensure maximum precision and cost-effectiveness in any production system. IO-Link is completely integrated in Totally Integrated Automation (TIA) and offers many advantages.

- The open standard permits the networking of devices from different manufacturers
- Simple wiring facilitates the installation process
- Reduced wiring effort saves time and money during installation
- Efficient engineering facilitates configuration and commissioning
- High-speed diagnostics ensures short plant standstill times and high plant availability
- High process transparency permits, for example, efficient energy management

Overview



SIMATIC ET 200SP

The scalable SIMATIC ET 200SP I/O system is a highly flexible, modular I/O system with IP20 degree of protection. Via interface modules with PROFINET or PROFIBUS interface it can exchange IO data of the connected I/O modules with a higher-level control system. Alternatively, as further head-end stations, various PLC, F-PLC and open controllers are available as compact S7-1500 controllers (distributed controllers). ET 200SP components are available as SIPPLUS version for extreme requirements and a high degree of robustness.

Compact design

- Modular configuration with up to 64 modules
- System-integrated self-assembling load group supply without power module via light BaseUnits
- Small size and highly flexible due to the modular design and comprehensive product range
- Up to 16 channels per module
- Permanent wiring
- Hot swapping: Module replacement without tools in RUN
- Operation with gaps

Flexible connection system

- Push-in terminals for cross-sections up to 2.5 mm²
- BaseUnits for 1-wire or direct multi-wire connection
- Optimum accessibility for wiring due to spring release and measuring tap next to the conductor opening
- Flexible PROFINET-connection via BusAdapter (RJ45, FastConnect, FiberOptic), also as integrated media converter

Safety Integrated

- Easy integration of fail-safe modules
- Easy F parameter assignment via software
- Group-by-group disconnection of non-failsafe modules

High performance

- Isochronous PROFINET
- Internal data transfer with up to 100 Mbit/s
- Record analog values and output as of 50 µs
- Record digital values and output as of 1 µs

High-performance technology

- Modules for the functions Counting, Positioning, Weighing

Energy efficiency

- Energy meter for recording electrical variables
- System-integrated PROFIenergy with interval substitute values

Advanced functions

- Configuration control:
Practical adaptation of the actual configuration via user software (option handling)
- Time-based IO:
Time stamping of the signals to the µs
- MSI/MSO:
Simultaneous access to I/O data from up to 4 PLCs
- Oversampling:
N-fold acquisition or output of digital and analog signals within a PN cycle

Communication standards

- PROFINET IO
- PROFIBUS DP V0/V1
- ET connection for connecting the ET 200AL (IP67)
- IO-Link V1.1
- AS-Interface
- Point-to-point (RS 232, RS 485, RS 422)

CPU

- PROFINET connection with 3 ports
- IO Controller and PNIO Device
- Optional expansion as DP master/slave
- Also as failsafe version and open controller

Labeling of I/O modules

- Meaningful labeling on the front of the I/O modules
- Optionally expandable with
 - Labeling strips
 - Reference identification label

I/O systems

ET 200 systems for the control cabinet
ET 200SP

Introduction

Overview (continued)

Overview of ET 200SP components

Basic components	Function
Mounting rail according to EN 60715	The mounting rail is the module support of the ET 200SP. The ET 200SP is mounting on the mounting rail.
CPU	<p>The CPU:</p> <ul style="list-style-type: none"> • executes the user program. • is used as IO Controller, I-Device on PROFINET IO, or as standalone CPU • connects the ET 200SP with the IO Devices or the IO Controller • exchanges data with the I/O modules via the backplane bus <p>Further functions of the CPU:</p> <ul style="list-style-type: none"> • Communication via PROFIBUS DP (in combination with the CM DP communication module, the CPU can be used as DP master or slave) • Integrated Web server • Integrated technology • Integrated trace functionality • Integrated system diagnostics • Integrated safety
Open controller	<p>As the first controller of this type, the SIMATIC ET 200SP Open Controller combines the functions of a PC-based software controller with visualization, PC applications and central I/Os (inputs/outputs) in a single, compact device.</p> <ul style="list-style-type: none"> • All in one • High system availability • Compact and modular • Rugged • User-friendly design • Efficient engineering in the TIA Portal
Interface modules for PROFINET IO (IM 155-6PN)	<p>The interface module:</p> <ul style="list-style-type: none"> • is used as IO Device on the PROFINET IO • connects the ET 200SP with the IO Controller • exchanges data with the I/O modules via the backplane bus
Interface module for PROFIBUS DP (IM 155-6DP)	<p>The interface module:</p> <ul style="list-style-type: none"> • is used as DP slave on the PROFIBUS DP • connects the ET 200SP with the DP master • exchanges data with the I/O modules via the backplane bus
BusAdapter (BA)	<p>BusAdapters permit the free selection of the connection method and connection technology for head-end stations with PROFINET interface. The following versions are currently available:</p> <ul style="list-style-type: none"> • BA 2xRJ45 (copper) • BA 2xFC (FastConnect, direct connection) • BA 2xSCRJ (FOC, POF or PCF) • BA SCRJ/RJ45 (media converter FOC-copper RJ45) • BA SCRJ/FC (media converter FOC-copper FC) <p>Cable length between 2 stations: max. 100 m (copper), max. 50 m (POF), max. 100 m (PCF), max. 250 m (PCF-GI).</p> <p>For expanding the station with the I/O systems ET 200AL via ET-connection, the BusAdapter BA-Send is available.</p>

Basic components	Function
BaseUnit (BU)	<p>The BaseUnits provide the electrical and mechanical connection for the ET 200SP components.</p> <ul style="list-style-type: none"> • Bright BaseUnits permit a new potential group up to max. 10 A • Dark BaseUnits forward the self-assembling voltage busbars P1, P2 and AUX from the left to the right BaseUnit. • Suitable BaseUnits with 12 to 28 terminals are available for different connection systems and functions. • The I/O module is plugged onto the desired BaseUnit and determines the potential assignment of the terminals on the BaseUnit. • For expanding the station with the I/O systems ET 200AL via ET-connection, the BaseUnit BU-Send is available.
I/O modules and fail-safe I/O modules	<p>The I/O module determines the function at the terminals. The controller detects the current process state via the connected sensors and triggers corresponding responses via the connected actuators. Some I/O modules feature extended functions, in part they are also designed as individual operating mode. I/O module are divided into the following module types; the fail-safe versions are identified by a preceding "F-" and a yellow module enclosure.</p> <ul style="list-style-type: none"> • DI (digital input) • DO (digital output) • AI (analog input) • AO (analog output) • TM (technology modules) • CM (communication modules) • SM (special modules)
Protective cover (BU cover)	<p>The ET 200SP system can be operated with any number of slot gaps (BU slot without I/O module). Applications for this include:</p> <ul style="list-style-type: none"> • partial commissioning • prewired, and currently unequipped options <p>To protect against damage, such slot gaps must be covered by a BU cover. Within des BU cover, an equipment labeling plate for the planned I/O module can be stored.</p> <p>Versions:</p> <ul style="list-style-type: none"> • for BaseUnits with a width of 15 mm • for BaseUnits with a width of 20 mm
Server module	<p>The server module concludes the setup of an ET 200SP station. On the server module there are holders for 3 spare fuses (5 × 20 mm). The server module is included in the scope of delivery of all head-end stations.</p>

Overview (continued)

Basic components	Function	Basic components	Function
Coding element	<p>When plugging an I/O module onto a BaseUnit for the first time, the coding element moves from the I/O module to the BaseUnit. There it prevents the destruction of the ET 200SP components in the event of a subsequent module replacement with incorrectly selected I/O module.</p> <p>The coding element is available in two versions:</p> <ul style="list-style-type: none"> • Mechanical coding element • Electronic coding element: Additionally features an electronic, re-writable memory for the redundant storage of module-specific configuration data (e.g. F target address for fail-safe modules, parameter data for IO-Link master). Thus these data are automatically backed up during a module replacement. 	Reference identification label	<p>Optionally, one equipment labeling plate each can be plugged onto head-end stations, BusAdapters, BaseUnits, and I/O modules. Equipment labeling plates are supplied in packs of 10 sheets with 16 labels each. The labels can be printed with thermal-transfer card printers, inkjet printers or plotting units or stickers can be attached to them. Advantages compared to labels that are attached directly:</p> <ul style="list-style-type: none"> • The inscription on the front is not covered • Simple label replacement when replacing a module • No parallax errors when marking the BaseUnits on the mounting plate <p>The size of the inscribable area of the labels is 14.8 x 10.5 mm (W x H)</p>
Shield connection	<p>The shield connection permits the connection of cable shields. Compared to external shield supports, the system offers the following advantages:</p> <ul style="list-style-type: none"> • Quick installation without tools by plugging the shield connection element onto the BaseUnit • Automatic low-impedance connection to the functional ground (mounting rail) • Optimized EMC-properties by separating the supply voltage lines from the signal lines by means of the shield connection element and short, unshielded cable lengths • Low space requirements 	Color-coded labels	<p>The I/O modules that are plugged onto the BaseUnits determine the potentials connected at the process terminals. These potentials can optionally be identified using module-specific color-coded labels. The potentials of the AUX and add-on terminals can also be marked using color-coded labels. Advantages of the color-coded labels:</p> <ul style="list-style-type: none"> • Quick installation (one label for marking 16 terminals) • Avoidance of wiring errors • Simple detection of potentials during servicing
Labeling strips	<p>Optionally, for system-specific marking the head-end stations and I/O modules can be equipped with labeling strips (13 x 31 mm). The labeling strips can be inscribed mechanically. Labeling strips are available in two versions in the colors light gray and yellow:</p> <ul style="list-style-type: none"> • 500 strips on the roll, for printing on thermal-transfer printers. Core diameter 40 mm, external diameter 70 mm, width 62 mm. • 10 DIN A4 sheets with 100 strips each, cardboard, preperforated, for printing using a laser printer direct from TIA-Portal or via print templates. 		

I/O systems

ET 200 systems for the control cabinet
ET 200SP - Interface modules

IM 155-6

Overview



- Interface module for connecting the I/O modules to a higher-level control with PROFINET or PROFIBUS
- Server module included in the scope of delivery
- Station expansion with IP67 I/O system ET200AL via ET-connection to BU-Send/BA-Send
- PROFINET bus connection
 - 2 ports for linear topology
 - Selectable PN connection via BusAdapter (ST, HF)
 - Two integrated RJ45 sockets (BA)
- PROFIBUS bus connection
 - 9-pole sub D socket function classes
 - PROFIBUS connector included in the scope of delivery
 - Hot swapping (module replacement during operation)
 - Startup and operation with gaps
 - Dynamic re-parameterization in RUN
 - Configuration control (option handling)
 - Plug-in 24 V DC power supply connector
 - Electronically readable rating plate (I&M data)

Technical specifications

Article number	6ES7155-6AA00-0BNO	6ES7155-6AU00-0BNO	6ES7155-6AU00-0CN0	6ES7155-6BA00-0CN0
	IM155-6PN ST INCL. BA 2XRJ45	IM155-6PN ST	ET 200SP IM155-6PN HF	IM155-6DP HF INCL. DP-CONNECTOR
Product type designation				
General information				
Product function				
• I&M data	Yes	Yes	Yes; I&M0 to I&M4	Yes; I&M0 to I&M3
Engineering with				
• STEP 7 TIA Portal can be configured/integrated as of version	V11 SP2 with HSP0024 / -	V11 SP2 with HSP0024 / -	V12 SP1 / V13	- / -
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision				GSD as of Revision 5
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	
Supply voltage				
Type of supply voltage			DC	DC
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Mains buffering				
• Mains/voltage failure stored energy time	5 ms	5 ms	5 ms	5 ms
Hardware configuration				
Rack				
• Modules per rack, max.	32	32	64	

Technical specifications (continued)

Article number	6ES7155-6AA00-0BN0 IM155-6PN ST INCL. BA 2XRJ45	6ES7155-6AU00-0BN0 IM155-6PN ST	6ES7155-6AU00-0CN0 ET 200SP IM155-6PN HF	6ES7155-6BA00-0CN0 IM155-6DP HF INCL. DP-CONNECTOR
Interfaces				
Number of PROFINET interfaces	1	1	1	
Number of PROFIBUS interfaces				1
1st interface				
Interface types				
- Number of ports	2	2	2	
- Integrated switch	Yes	Yes	Yes	
- RJ 45 (Ethernet)	Yes; Pre-assembled BusAdapter BA 2x RJ45			
- RS 485				Yes
- Bus adapter (PROFINET)	Yes; Applicable BusAdapters: BA 2x RJ45, BA 2x FC	Yes; Applicable BusAdapters: BA 2x RJ45, BA 2x FC	Yes; Applicable bus adapters: BA 2xRJ45, BA 2xFC, BA 2xSCRJ (as from FS03)	
- Output current of the interface, max.				90 mA
Protocols				
- PROFINET IO Device	Yes	Yes	Yes	
- Open IE communication	Yes	Yes	Yes	
- PROFIBUS DP slave				Yes
- Media redundancy	Yes	Yes	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring	
Interface types				
RJ 45 (Ethernet)				
• 10 Mbps	Yes; for Ethernet services	Yes; for Ethernet services	Yes; for Ethernet services	
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	
• Autonegotiation	Yes	Yes	Yes	
• Autocrossing	Yes	Yes	Yes	
RS 485				
• Transmission rate, max.				12 Mbit/s
Protocols				
PROFINET IO				
• PROFINET IO	Yes	Yes	Yes	
PROFINET IO Device				
Services				
- Isochronous mode	No		Yes; Bus cycle time: min. 250 µs	
- Open IE communication	Yes	Yes	Yes	
- IRT	Yes; with send cycles of between 250 µs and 4 ms in increments of 125 µs	Yes; with send cycles of between 250 µs and 4 ms in increments of 125 µs	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 µs to 4 ms in 125 µs frame	
- MRP			Yes	
- MRPD			Yes	
- PROFInergy	Yes	Yes	Yes	
- Prioritized startup	Yes	Yes	Yes	
- Shared device	Yes	Yes	Yes	
- Number of IO controllers with shared device, max.	2	2	4	

I/O systems

ET 200 systems for the control cabinet
ET 200SP - Interface modules

IM 155-6**Technical specifications** (continued)

Article number	6ES7155-6AA00-0BNO IM155-6PN ST INCL. BA 2XRJ45	6ES7155-6AU00-0BNO IM155-6PN ST	6ES7155-6AU00-0CNO ET 200SP IM155-6PN HF	6ES7155-6BA00-0CNO IM155-6DP HF INCL. DP-CONNECTOR
Open IE communication				
• TCP/IP	Yes	Yes	Yes	
• SNMP	Yes	Yes	Yes; MIB2, LLDP-MIBm, MRP-MIB	
• LLDP	Yes	Yes	Yes	
PROFIBUS				
Services				
- SYNC capability				Yes
- FREEZE capability				Yes
- DPV0				No
- DPV1				Yes
Isochronous mode				
Isochronous operation (application synchronized up to terminal)		No	Yes	
equidistance			Yes	
shortest clock pulse			250 µs	
max. cycle			4 ms	
Interrupts/diagnostics/ status information				
Status indicator	Yes	Yes	Yes	Yes
Alarms				
• Alarms	Yes	Yes	Yes	Yes
Diagnostic messages				
• Diagnostic functions	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• MAINT LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green LED	Yes; 2x green LED	Yes; 2x green LED	
• Connection display DP				Yes; Green DP LED
Isolation				
Isolation checked with	707 V DC between supply voltage and electronics; 1500 V AC between Ethernet and electronics	707 V DC between supply voltage and electronics (type test); 1500 V AC between Ethernet and electronics (type test)	707 V DC between supply voltage and electronics (type test); 1500 V AC between Ethernet and electronics (type test)	707 V DC (type test)
Standards, approvals, certificates				
Network loading class	3	3	3	
Security level	According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1	
Ambient conditions				
Ambient temperature in operation				
• horizontal installation, min.				0 °C
• horizontal installation, max.				60 °C
• vertical installation, min.				0 °C
• vertical installation, max.				50 °C
Dimensions				
Width	50 mm	50 mm	50 mm	50 mm
Height	117 mm	117 mm	117 mm	117 mm
Depth	74 mm	74 mm	74 mm	74 mm
Weights				
Weight, approx.	191 g; IM155PN ST with BA 2x RJ45 (mounted)	147 g; without bus adapter	147 g; without bus adapter	150 g

Ordering data	Article No.	Ordering data	Article No.
Interface module Basic <ul style="list-style-type: none"> IM 155-6PN BA, with server module 	6ES7155-6AR00-0AN0	Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0
Interface module Standard <ul style="list-style-type: none"> IM 155-6PN ST, with server module and installed BusAdapter BA 2xRJ45 IM 155-6PN ST, with server module, without BusAdapter 	6ES7155-6AA00-0BN0 6ES7155-6AU00-0BN0	500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer 1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer	6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0
Interface module High Feature <ul style="list-style-type: none"> IM 155-6DP HF, with server module, with multi-hot-swap, incl. PROFIBUS connector IM 155-6PN HF, incl. server module, without BusAdapter 	6ES7155-6BA00-0CN0 6ES7155-6AU00-0CN0	1000 labeling strips DIN A4, yellow, cardboard, preperforated, for inscription with laser printer	6ES7193-6LA10-0AG0
Accessories BusAdapter BA 2xRJ45 for IM 155-6PN ST, HF	6ES7193-6AR00-0AA0	DIN rail 35 mm Length: 483 mm for 19" cabinets	6ES5710-8MA11
BusAdapter BA 2xFC for IM 155-6PN ST, HF; for increased vibration and EMC loads	6ES7193-6AF00-0AA0	Length: 530 mm for 600 mm cabinets	6ES5710-8MA21
BusAdapter BA 2xSCRJ for IM 155-6PN HF, fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	6ES7193-6AP00-0AA0	Length: 830 mm for 900 mm cabinets	6ES5710-8MA31
BusAdapter BA SCRJ/RJ45 for IM 155-6PN HF; with media converter FOC-copper; 1 x SCRJ FO connection, 1 x RJ45 connection	6ES7193-6AP20-0AA0	Length: 2 m	6ES5710-8MA41
BusAdapter BA SCRJ/FC for IM 155-6PN HF; with media converter FOC-copper; 1 x SCRJ FO connection, 1 x FastConnect connection	6ES7193-6AP40-0AA0	Manuals for ET 200SP distributed I/O system SIMATIC ET 200SP Manual Collection: PDF file with the following content: <ul style="list-style-type: none"> Basic information System manual, product information, overview tables, correction information or manual supplements Device-specific information Manuals for the interface modules, PLC, OC and I/O modules incl. failsafe General information Function manuals The Manual Collection is available on the Internet as PDF file: https://support.industry.siemens.com/cs/de/en/view/84133942	
Station expansion with IP67 I/O system ET 200AL BusAdapter BA-Send 1 x FC for station expansion with IP67 I/O system ET 200AL	6ES7193-6AS00-0AA0	SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	6ES7998-8XC01-8YE0
BaseUnit BU-Send for accommodating the BusAdapter BA-Send 1 x FC	6ES7193-6BN00-0NE0	SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	6ES7998-8XC01-8YE2
Further accessories Reference identification label 10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit	6ES7193-6LF30-0AW0	Spare parts Server module Terminates an ET 200SP station, included in the scope of delivery of the interface modules	
Shield connection 5 shield connections and 5 shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional ground	6ES7193-6SC00-1AM0	Power supply connector for interface module for connecting the 24 V DC supply voltage <ul style="list-style-type: none"> with push-in terminals (10 units) with screw-type terminals (10 units) 	6ES7193-4JB00-0AA0 6ES7193-4JB50-0AA0

I/O systems

ET 200 systems for the control cabinet
ET 200SP - Interface modules

SIPLUS interface modules

Overview



- Interface module for linking the ET 200SP to PROFINET
- Handles all data exchange with the PROFINET IO Controller
- Bus Adapter (BA) for individual PROFINET connection
- Integrated 2-port switch for line configuration
- Max. 32 I/O modules
- Operation with gaps (non-equipped BaseUnits) possible
- Replacement of an I/O module possible during operation (single hot-swap)
- Load group formation without power module

Note:

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

Technical specifications

Article number	6AG1155-6AA00-7BN0
Based on	6ES7155-6AA00-0BN0 SIPLUS ET 200SP IM155-6PN ST
Ambient conditions	
Ambient temperature in operation	
• horizontal installation, min.	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

Article No.

SIPLUS IM 155-6PN Standard interface module
(Extended temperature range and medial exposure)
With server module and installed bus adapter BA 2xRJ45

6AG1155-6AA00-7BN0

Accessories

See SIMATIC ET 200SP, IM 155-6 PN Standard interface module, page 9/11

Overview



- 4, 8 and 16-channel DI modules
- BaseUnits for single-wire or multi-wire connection
- Function classes Basic, Standard, High-Feature, High-Speed as well as fail-safe DI
- Clear labeling on front of module
- LEDs for diagnostics, status, and error
- Individual system-integrated load group formation with self-assembling voltage busbars (power module not required for ET 200SP)
- Electronically readable rating plate (I&M data)
- Partially with additional operating modes
- Optional accessories
 - Labeling Strips
 - Equipment marking label
 - Color-coded label with module-specific CC code
 - Shield terminal
- Alternatively, partially also available as pack of 10 (Ordering quantities: integer multiples of ten only)

Overview of digital input modules

Digital input	Article number	CC code	BU type	PU
DI 16 x DC 24 V ST	6ES7131-6BH00-0BA0	CC00	A0	1
DI 16 x DC 24 V ST	6ES7131-6BH00-2BA0	CC00	A0	10
DI 8 x 24 V DC BA	6ES7131-6BF00-0AA0	CC01	A0	1
DI 8 x 24 V DC BA	6ES7131-6BF00-2AA0	CC01	A0	10
DI 8 x 24 V DC SRC BA	6ES7131-6BF60-0AA0	CC02	A0	1
DI 8 x 24 V DC ST	6ES7131-6BF00-0BA0	CC01	A0	1
DI 8 x 24 V DC ST	6ES7131-6BF00-2BA0	CC01	A0	10
DI 8 x 24 V DC HF	6ES7131-6BF00-0CA0	CC01	A0	1
DI 8 x NAMUR HF	6ES7131-6TF00-0CA0	CC01	A0	1
DI 8 x 24 V DC HS	6ES7131-6BF00-0DA0	CC01	A0	1
With three operating modes:				
• High-speed isochronous DI				
• 4 pulse counters 32-bit, 10 kHz				
• Oversampling				
DI 4 x 120...230 V AC ST	6ES7131-6FD00-0BB1	CC41	B1	1

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

Digital input modules**Overview** (continued)

Overview of BaseUnits

BaseUnit	Article number	CC codes for process terminals	CC codes for AUX terminals	PU
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10
BU type B1 • Forwarding of load group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	6ES7193-6BP20-0BB1	CC41	--	1

Technical specifications

Article number	6ES7131-6BF00-0BA0 DI 8X24VDC ST	6ES7131-6BF60-0AA0 DI 8X24VDC SOURCE BA	6ES7131-6BH00-0BA0 DI 16X24VDC ST	6ES7131-6BF00-0CA0 DI 8X24VDC HF	6ES7131-6TF00-0CA0 DI 8XNAMUR HF	6ES7131-6FD00-0BB1 DI 4X120..230VAC ST
Product type designation						
General information						
Product function						
• I&M data	Yes	Yes	Yes	Yes	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with						
• STEP 7 TIA Portal can be configured/integrated as of version	V11 SP2 / V13	V13 / V13	V11 SP2 / V13	V12 SP1 / V13	V13 / V13	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5	GSD Revision 5	GSD as of Revision 5	GSD Revision 5	GSD Revision 5	GSD as of Revision 5
• PROFINET as of GSD version/GSD revision					V2.3	V2.3 / -
Operating mode						
• DI	Yes	Yes	Yes	Yes		
• Counter	No	No	No	No		
• Oversampling	No	No	No	No		
• MSI	No	No	No	Yes		
Supply voltage						
Type of supply voltage	DC	24 V DC	DC	DC	24 V DC	100 - 240 V AC
Rated value (DC)	24 V	24 V	24 V	24 V	24 V	
Rated value (AC)						230 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes	Yes
Encoder supply						
Number of outputs		8			8	4
short-circuit protection					Yes	No; when using BU type B1, a fuse with 10 A tripping current must be provided
Output current						
• up to 60 °C, max.						10 A
24 V encoder supply						
• 24 V	Yes			Yes		
• short-circuit protection	Yes			Yes		
• Output current, max.	700 mA			700 mA		
Digital inputs						
Number of digital inputs	8	8	16	8	8	4
Digital inputs, configurable					Yes	
Type					NAMUR	
m/p-reading	p-reading	Yes; m-reading	p-reading	p-reading		No
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes		
Input characteristic curve in accordance with IEC 61131, type 2	No	No	No	No		
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes	Yes		Yes
Pulse extension	No	No	No	Yes; Pulse duration from 4 µs	Yes; 0.5 s, 1 s, 2 s	No
• Length				50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s		
Edge evaluation					Yes; rising edge, falling edge, edge change	
Signal change flutter					Yes; 2 to 32 signal changes	
Flutter observation window					Yes; 0.5 s, 1 s to 100 s in 1-s steps	

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

Digital input modules

Technical specifications (continued)

Article number	6ES7131-6BF00-0BA0	6ES7131-6BF60-0AA0	6ES7131-6BH00-0BA0	6ES7131-6BF00-0CA0	6ES7131-6TF00-0CA0	6ES7131-6FD00-0BB1
	DI 8X24VDC ST	DI 8X24VDC SOURCE BA	DI 16X24VDC ST	DI 8X24VDC HF	DI 8XNAMUR HF	DI 4X120..230VAC ST
Input voltage						
• Type of input voltage	DC	DC	DC	DC	DC	120/230V AC (47 Hz to 63 Hz) 230 V
• Rated value (AC)						
• Rated value (DC)	24 V	24 V	24 V	24 V	8.2 V	
• for signal "0"	-30 to +5V	30 V to -5 V (reference potential is L+)	-30 to +5V	-30 to +5V		0V AC to 40V AC
• for signal "1"	+11 to +30V	-11 V to -30 V (reference potential is L+)	+11 to +30V	+11 to +30V		74 V AC to 264 V AC
Input current						
• for signal "1", typ.	2.5 mA	6 mA	2.5 mA	2.5 mA		10.8 mA
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 to 1.2 mA	
- for signal "1"					2.1 to 7 mA	
Input delay (for rated value of input voltage)						
• Tolerated changeover time for changeover contacts					300 ms	
for standard inputs						
- Parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)		No
for interrupt inputs						
- Parameterizable	No	No	No	Yes		
for counter/technological functions						
- Parameterizable	No	No	No	No		
for NAMUR inputs						
- at "0" to "1", max.					12 ms	
- at "1" to "0", max.					12 ms	
Cable length						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	200 m	1 000 m
• Unshielded, max.	600 m	200 m	600 m	600 m		600 m
Encoder						
Connectable encoders						
• NAMUR encoder/changeover contact according to EN 60947					Yes	
• Single contact / changeover contact unconnected					Yes	
• Single contact / changeover contact connected with 10 kΩ					Yes	
• 2-wire sensor	Yes	Yes	Yes	Yes		Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA	1.5 mA		

Technical specifications (continued)

Article number	6ES7131-6BF00-0BA0 DI 8X24VDC ST	6ES7131-6BF60-0AA0 DI 8X24VDC SOURCE BA	6ES7131-6BH00-0BA0 DI 16X24VDC ST	6ES7131-6BF00-0CA0 DI 8X24VDC HF	6ES7131-6TF00-0CA0 DI 8XNAMUR HF	6ES7131-6FD00-0BB1 DI 4X120..230VAC ST
Isochronous mode						
Isochronous operation (application synchronized up to terminal)	No	No	No	Yes		No
Filtering and processing time (TCI), min.				420 µs		
Bus cycle time (TDP), min.				500 µs		
Interrupts/diagnostics/ status information						
Alarms						
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes; channel by channel	No
• Hardware interrupt		No		Yes	Yes; Parameterizable, channels 0 to 7	No
Diagnostic messages						
• Diagnostic information readable	Yes	Yes	Yes	Yes	Yes	
• Diagnostics	Yes	Yes	Yes	Yes		
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes	
• Wire break	Yes		Yes	Yes	Yes	
• Short circuit	Yes	No	No	Yes	Yes	
• Group error					Yes	
Diagnostics indication LED						
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No	No	Yes; Red LED	Yes; Red LED	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Galvanic isolation						
Electrical isolation channels						
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes	Yes
Isolation						
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	2545V DC 2s (routine test)
Standards, approvals, certificates						
Suitable for safety functions					No	No
Dimensions						
Width	15 mm	15 mm	15 mm	15 mm	15 mm	20 mm
Weights						
Weight, approx.	28 g	28 g	28 g	28 g	32 g	36 g

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules

Digital input modules

Ordering data

Digital input modules

Digital input module DI 8x24 V DC Basic, BU type A0, color code CC01

- PU: 1 unit
- PU: 10 units

Digital input module DI 8x24 V DC Source Input, Basic, BU type A0, color code CC02; PU: 1 unit

Digital input module DI 8x24 V DC Standard, BU type A0, color code CC01

- PU: 1 unit
- PU: 10 units

Digital input module DI 16x24 V DC Standard, BU type A0, color code CC00

- PU: 1 unit
- PU: 10 units

Digital input module DI 8x24 V DC High Feature, BU type A0, color code CC01, channel-specific diagnostics, isochronous mode, shared input (MSI), PU: 1 unit

Digital input module DI 8x24VDC High Speed, BU type A0, color code CC01, 3 operating modes (high-speed isochronous DI, 4 pulse counters 32-bit 10 kHz, oversampling); PU: 1 unit

Digital input module DI 8xNAMUR High Feature, BU type A0, color code CC01; PU: 1 unit

Digital input module DI 4x120 V AC-230 V AC Standard, BU type B1, color code CC41; PU: 1 unit

Article No.

6ES7131-6BF00-0AA0

6ES7131-6BF00-2AA0

6ES7131-6BF60-0AA0

6ES7131-6BF00-0BA0

6ES7131-6BF00-2BA0

6ES7131-6BH00-0BA0

6ES7131-6BH00-2BA0

6ES7131-6BF00-0CA0

6ES7131-6BF00-0DA0

6ES7131-6TF00-0CA0

6ES7131-6FD00-0BB1

Article No.

Supported BaseUnits

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- PU: 1 unit
- PU: 10 units

6ES7193-6BP20-0DA0

6ES7193-6BP20-2DA0

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

- PU: 1 unit
- PU: 10 units

6ES7193-6BP00-0DA0

6ES7193-6BP00-2DA0

BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- PU: 1 unit
- PU: 10 units

6ES7193-6BP20-0BA0

6ES7193-6BP20-2BA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- PU: 1 unit
- PU: 10 units

6ES7193-6BP00-0BA0

6ES7193-6BP00-2BA0

BU20-P12+A0+4B

BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; PU: 1 unit

6ES7193-6BP20-0BB1

Ordering data	Article No.		Article No.
Accessories		Color-coded labels for 15 mm wide BaseUnits	
Reference identification label	6ES7193-6LF30-0AW0	Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	6ES7193-6CP00-2MA0
10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit		Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	6ES7193-6CP01-2MA0
Labeling strips		Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), blue (terminals 9 to 16), 10 units	6ES7193-6CP02-2MA0
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	Color code CC71, for 10 AUX terminals, BU type A0, yellow-green (terminals 1 A to 10 A); 10 units	6ES7193-6CP71-2AA0
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	6ES7193-6CP72-2AA0
1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer	6ES7193-6LA10-0AA0	Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	6ES7193-6CP73-2AA0
1000 labeling strips DIN A4, yellow, cardboard, preperforated, for inscription with laser printer	6ES7193-6LA10-0AG0	Color-coded labels for 20 mm wide BaseUnits	
BU cover		Color code CC41, for 16 process terminals, BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	6ES7193-6CP41-2MB0
for covering empty slots (gaps); 5 units			
• 15 mm wide	6ES7133-6CV15-1AM0		
Shield connection	6ES7193-6SC00-1AM0		
5 shield supports and 5 shield terminals			

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

Digital output modules

Overview



- 4, 8 and 16-channel DQ modules
- 4-channel RQ modules
- BaseUnits for single-wire or multi-wire connection
- Function classes Basic, Standard, High-Feature, High-Speed as well as fail-safe DQ and RQ
- Clear labeling on front of module
- LEDs for diagnostics, status, and error
- Individual system-integrated load group formation with self-assembling voltage busbars (power module not required for ET 200SP)
- Electronically readable rating plate (I&M data)
- Partially with additional operating modes
- Optional accessories
 - Labeling strips
 - Equipment marking label
 - Color-coded label with module-specific CC code
 - Shield terminal
- Alternatively, partially also available as pack of 10 (Ordering quantities: integer multiples of ten only)

Overview of digital output modules

Digital output	Article number	CC code	BU type	PU
DQ 16 x 24 V DC/0.5 A ST	6ES7132-6BH00-0BA0	CC00	A0	1
DQ 16 x 24 V DC/0.5 A ST	6ES7132-6BH00-2BA0	CC00	A0	10
DQ 8 x 24 V DC/0.5 A SNK BA	6ES7132-6BF60-0AA0	CC01	A0	1
DQ 8 x 24 V DC/0.5 A ST	6ES7132-6BF00-0BA0	CC02	A0	1
DQ 8 x 24 V DC/0.5 A ST	6ES7132-6BF00-2BA0	CC02	A0	10
DQ 8 x 24 V DC/0.5 A HF	6ES7132-6BF00-0CA0	CC02	A0	1
DQ 4 x 24 V DC/2 A ST	6ES7132-6BD20-0BA0	CC02	A0	1
DQ 4 x 24 V DC/2 A ST	6ES7132-6BD20-2BA0	CC02	A0	10
DQ 4 x 24 V DC/2 A HF	6ES7132-6BD20-0CA0	CC02	A0	1
DQ 4 x 24 V DC/2 A HF	6ES7132-6BD20-2CA0	CC02	A0	10
DQ 4 x 24 V DC/2 A HS	6ES7132-6BD20-0DA0	CC02	A0	1
With three operating modes				
• High-speed isochronous DQ with valve control				
• Pulse width modulation				
• Oversampling				
DQ 4 x 24...230 V AC/2 A ST	6ES7132-6FD00-0BB1	CC41	B0, B1	1
RQ 4 x 24 V UC/2 A CO ST	6ES7132-6GD50-0BA0	--	A0	1
RQ 4 x 120 V DC - 230 V AC/5 A NO ST	6ES7132-6HD00-0BB1	--	B0, B1	1

Overview (continued)

Overview of BaseUnits

BaseUnit	Article number	CC codes for process terminals	CC codes for AUX terminals	PU
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10
BU type B0 • Forwarding of load group (dark) • 12 process terminals • With 4 AUX terminals	6ES7193-6BP20-0BB0	CC41	CC81 to CC83	1
BU type B1 • Forwarding of load group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	6ES7193-6BP20-0BB1	CC41	--	1

I/O systems

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Digital output modules

Technical specifications

Article number	6ES7132-6BD20-0BA0	6ES7132-6BD20-0CA0	6ES7132-6FD00-0BB1	6ES7132-6BF00-0BA0	6ES7132-6BF00-0CA0
	DQ 4X24VDC/2A ST	DQ 4X24VDC/2A HF	DQ 4X24..230VAC/2A ST	DQ 8X24VDC/0,5A ST	DQ 8X24VDC/0,5A HF
Product type designation					
General information					
Product function					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with					
• STEP 7 TIA Portal can be configured/integrated as of version	V11 SP2 / V13	V13 / V13	V13 / V13	V11 SP2 / V13	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5	GSD Revision 5	GSD as of Revision 5	GSD Revision 5	GSD Revision 5
Operating mode					
• DQ	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No	No
• PWM	No	No	No	No	No
• Oversampling	No	No	No	No	No
• MSO	No	Yes	No	No	Yes
Supply voltage					
Type of supply voltage	DC	DC	24 V AC to 230 V AC	DC	DC
Rated value (DC)	24 V	24 V		24 V	24 V
Rated value (AC)			230 V		
Reverse polarity protection	Yes	Yes		Yes	Yes
Digital outputs					
Type of digital output			Triac with zero point detection		
Number of digital outputs	4	4	4	8	8
Current-sinking	No	No	No	No	No
Current-sourcing	Yes	Yes	Yes	Yes	Yes
Digital outputs, configurable short-circuit protection	Yes	Yes	No	Yes	Yes
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	L+ -(37 to 41V)	No; when using BU type B1, a fuse with 10 A tripping current must be provided	Typ. L+ (-50 V)	Typ. L+ (-50 V)
Controlling a digital input	Yes	Yes; Minimum current consumption 7 mA		Yes	Yes
Switching capacity of the outputs					
• with resistive load, max.	2 A	2 A	2 A	0.5 A	0.5 A
• on lamp load, max.	10 W	10 W	100 W	5 W	5 W
Load resistance range					
• lower limit	12 Ω	12 Ω		48 Ω	48 Ω
• upper limit	3 400 Ω	3 400 Ω		12 kΩ	12 kΩ
Output voltage					
• Type of output voltage			24 V AC to 230 V AC		
• for signal *1*, min.			20.4 V		
• Permissible voltage at output, min.			20.4 V		
• Permissible voltage at output, max.			264 V		

Technical specifications (continued)

Article number	6ES7132-6BD20-0BA0 DQ 4X24VDC/2A ST	6ES7132-6BD20-0CA0 DQ 4X24VDC/2A HF	6ES7132-6FD00-0BB1 DQ 4X24..230VAC/ 2A ST	6ES7132-6BF00-0BA0 DQ 8X24VDC/0,5A ST	6ES7132-6BF00-0CA0 DQ 8X24VDC/0,5A HF
Output current					
• for signal "1" rated value	2 A	2 A	2 A	0.5 A	0.5 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA	460 µA	0.1 mA	0.1 mA
Output delay with resistive load					
• "0" to "1", typ.	50 µs	50 µs			50 µs
• "0" to "1", max.	50 µs		10 ms	50 µs	
• "1" to "0", typ.	100 µs	100 µs			100 µs
• "1" to "0", max.	100 µs		10 ms	100 µs	
Parallel switching of 2 outputs					
• for logic links			No		
• for increased power	No	No	No	No	No
• for redundant control of a load	Yes		Yes	Yes	Yes
Switching frequency					
• with resistive load, max.	100 Hz	100 Hz	10 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	0.5 Hz	2 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz	1 Hz	10 Hz	10 Hz
Aggregate current of the outputs					
• Current per channel, max.			2 A		
• Current per module, max.	8 A	8 A	8 A	4 A	4 A
Total current of the outputs (per module)					
horizontal installation					
- up to 30 °C, max.	8 A	8 A			
- up to 40 °C, max.	8 A	8 A	8 A		
- up to 50 °C, max.	6 A	6 A	6 A		
- up to 60 °C, max.	4 A	4 A	4 A	4 A	4 A
vertical installation					
- up to 30 °C, max.	8 A	8 A	8 A		
- up to 40 °C, max.	6 A	6 A	6 A		
- up to 50 °C, max.	4 A	4 A	4 A	4 A	4 A
- up to 60 °C, max.	4 A				
Output current per channel					
horizontal installation					
- up to 60 °C, max.			2 A		
vertical installation					
- up to 50 °C, max.			2 A		
Triac outputs					
• Size of motor starters according to NEMA, max.			5		
Cable length					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	No	Yes	No	No	Yes
Execution and activation time (TCO), min.					48 µs
Bus cycle time (TDP), min.		500 µs			500 µs

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ET 200SP - I/O modules

Digital output modules

Technical specifications (continued)

Article number	6ES7132-6BD20-0BA0 DQ 4X24VDC/2A ST	6ES7132-6BD20-0CA0 DQ 4X24VDC/2A HF	6ES7132-6FD00-0BB1 DQ 4X24..230VAC/ 2A ST	6ES7132-6BF00-0BA0 DQ 8X24VDC/0,5A ST	6ES7132-6BF00-0CA0 DQ 8X24VDC/0,5A HF
Interrupts/diagnostics/ status information					
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	No	Yes	Yes
Diagnostic messages					
• Diagnostics	Yes	Yes	No	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	No	Yes	Yes
• Wire break	Yes	Yes		Yes	Yes
• Short circuit	Yes	Yes		Yes	Yes
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics		Yes; Red LED			Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Galvanic isolation					
Electrical isolation channels					
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes
Isolation					
Isolation checked with	707 V DC (type test)	707 V DC (type test)	2545V DC 2s (routine test)	707 V DC (type test)	707 V DC (type test)
Dimensions					
Width	15 mm	15 mm	20 mm	15 mm	15 mm
Weights					
Weight, approx.	30 g	30 g	50 g	28 g	30 g
Article number	6ES7132-6BF60-0AA0 DQ 8X24VDC/0,5A SINK BASIC	6ES7132-6BH00-0BA0 DQ 16X24VDC/0,5A ST	6ES7132-6HD00-0BB0 RQ NO 4X120VDC..230VAC/ 5A ST	6ES7132-6GD50-0BA0 RQ 4X24VDC/2A CO ST	
Product type designation					
General information					
Product function					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	
Engineering with					
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13	V11 SP2 / V13	V12 SP1 / V13	V13 / V13	
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5	GSD Revision 5	
Operating mode					
• DQ	Yes	Yes	Yes	Yes	
• DQ with energy-saving function	No	No	No	No	
• PWM	No	No	No	No	
• Oversampling	No	No	No	No	
• MSO	No	No	No	No	
Supply voltage					
Type of supply voltage	24 V DC	DC	DC	DC	
Rated value (DC)	24 V	24 V	24 V	24 V	
Reverse polarity protection		Yes	Yes		

Technical specifications (continued)

Article number	6ES7132-6BF60-0AA0 DQ 8X24VDC/0,5A SINK BASIC	6ES7132-6BH00-0BA0 DQ 16X24VDC/0,5A ST	6ES7132-6HD00-0BB0 RQ NO 4X120VDC..230VAC/ 5A ST	6ES7132-6GD50-0BA0 RQ 4X24VDC/2A CO ST
Digital outputs				
Type of digital output			Relays	Relays
Number of digital outputs	8	16	4	4
Current-sinking	Yes	No		
Current-sourcing	No	Yes		
Digital outputs, configurable	Yes	Yes		
short-circuit protection	Yes	Yes	No	No
Open-circuit detection	No			
Limitation of inductive shutdown voltage to	Typ. 47 V	Typ. L+ (-50 V)		
Controlling a digital input	Yes	Yes		
Switching capacity of the outputs				
• with resistive load, max.	0.5 A	0.5 A		
• on lamp load, max.	5 W	5 W		
Load resistance range				
• lower limit	48 Ω	48 Ω		
• upper limit	3 400 Ω	12 kΩ		
Output current				
• for signal "1" rated value	0.5 A	0.5 A		
• for signal "0" residual current, max.	5 μA	0.1 mA		
Output delay with resistive load				
• "0" to "1", typ.		50 μs		
• "0" to "1", max.	300 μs			
• "1" to "0", typ.		100 μs		
• "1" to "0", max.	600 μs			
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	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	2 Hz	0.5 Hz	
• on lamp load, max.	10 Hz	10 Hz	2 Hz	
Aggregate current of the outputs				
• Current per channel, max.	0.5 A			
• Current per module, max.	4 A	8 A	20 A	
Total current of the outputs (per module)				
horizontal installation				
- up to 30 °C, max.		8 A		
- up to 40 °C, max.		8 A		
- up to 50 °C, max.		6 A		
- up to 60 °C, max.	4 A	4 A		
vertical installation				
- up to 30 °C, max.		8 A		
- up to 40 °C, max.		6 A		
- up to 50 °C, max.	4 A	4 A		

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

Digital output modules**Technical specifications** (continued)

Article number	6ES7132-6BF60-0AA0 DQ 8X24VDC/0,5A SINK BASIC	6ES7132-6BH00-0BA0 DQ 16X24VDC/0,5A ST	6ES7132-6HD00-0BB0 RQ NO 4X120VDC..230VAC/ 5A ST	6ES7132-6GD50-0BA0 RQ 4X24VDC/2A CO ST
Relay outputs				
• Number of relay outputs			4	4
• Rated input voltage of relay coil L+ (DC)			24 V	24 V
• Current consumption of relays (coil current of all relays), max.			40 mA	40 mA
• external protection for relay outputs			Yes, with 6A	
Switching capacity of contacts				
- with resistive load, max.				2 A
- Thermal continuous current, max.			5 A	2 A
- Switching current, min.			100 mA	1 mA; 5 V DC
- rated switching voltage (DC)				24 V
- rated switching voltage (AC)				24 V
Cable length				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	200 m	200 m
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	No	No
Interrupts/diagnostics/ status information				
Substitute values connectable	No	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnostic messages				
• Diagnostics	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire break		Yes		
• Short circuit	No	Yes		
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Galvanic isolation				
Electrical isolation channels				
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
Isolation				
Isolation checked with	707 V DC (type test)	707 V DC (type test)		707 V DC (type test)
tested with				
• between channels and backplane bus/supply voltage			2500 V DC	
• between backplane bus and supply voltage			500 V DC	
Dimensions				
Width	15 mm	15 mm	20 mm	15 mm
Weights				
Weight, approx.	30 g	28 g	40 g	30 g

Ordering data	Article No.	Ordering data	Article No.
Digital output modules		Supported BaseUnits	
Digital output module DQ 16x24 V DC/0.5 A Standard, BU type A0, color code CC00 • PU: 1 unit • PU: 10 units	6ES7132-6BH00-0BA0 6ES7132-6BH00-2BA0	BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 inter- nally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A) • PU: 1 unit • PU: 10 units	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0
Digital output module DQ 8x24 V DC/0.5 A Sink Output, Basic, BU type A0, color code CC01; PU: 1 unit	6ES7132-6BF60-0AA0	BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A) • PU: 1 unit • PU: 10 units	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0
Digital output module DQ 8x24 V DC/0.5 A Standard, BU type A0, color code CC02 • PU: 1 unit • PU: 10 units	6ES7132-6BF00-0BA0 6ES7132-6BF00-2BA0	BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 inter- nally jumpered AUX terminals (1 A to 10 A); for continuing the load group • PU: 1 unit • PU: 10 units	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0
Digital output module DQ 8x24 V DC/0.5 A High Feature, BU type A0, color code CC02; PU: 1 unit	6ES7132-6BF00-0CA0	BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group • PU: 1 unit • PU: 10 units	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0
Digital output module DQ 4x24 V DC/2 A Standard, BU type A0, color code CC02 • PU: 1 unit • PU: 10 units	6ES7132-6BD20-0BA0 6ES7132-6BD20-2BA0	BU20-P12+A4+0B BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 inter- nally jumpered AUX terminals (1 A to 4 A); for continuing the load group; PU: 1 unit	6ES7193-6BP20-0BB0
Digital output module DQ 4x24 V DC/2 A High Feature, BU type A0, color code CC02, channel-precise diagnostics, isochronous mode, shared output (MSO); PU: 1 unit • PU: 1 unit • PU: 10 units	6ES7132-6BD20-0CA0 6ES7132-6BD20-2CA0	BU20-P12+A0+4B BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; PU: 1 unit	6ES7193-6BP20-0BB1
Digital output module DQ 4x24VDC/2A High Feature, BU type A0, color code CC02, 3 operating modes (high-speed isochronous DQ with valve control, pulse width modulation, oversampling); PU: 1 unit	6ES7132-6BD20-0DA0		
Digital output module DQ 4x24VAC...230VAC/2A Standard for BU type B1, color code CC41; 1 unit	6ES7132-6FD00-0BB1		
Signal relay module RQ CO 4x24 V UC/2 A Standard, changeover contact, BU type A0, color code CC00; PU: 1 unit	6ES7132-6GD50-0BA0		
Relay module RQ NO 4x120 V DC - 230 V AC/5 A Standard, normally-open contact, BU type B0, color code CC00; PU: 1 unit	6ES7132-6HD00-0BB0		

I/O systems

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Digital output modules

Ordering data	Article No.		Article No.
Accessories		Color-coded labels for 15 mm wide BaseUnits	
Reference identification label	6ES7193-6LF30-0AW0	Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	6ES7193-6CP00-2MA0
10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit		Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	6ES7193-6CP01-2MA0
Labeling strips		Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), blue (terminals 9 to 16), 10 units	6ES7193-6CP02-2MA0
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	Color code CC71, for 10 AUX terminals, BU type A0, yellow-green (terminals 1 A to 10 A); 10 units	6ES7193-6CP71-2AA0
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	6ES7193-6CP72-2AA0
1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer	6ES7193-6LA10-0AA0	Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	6ES7193-6CP73-2AA0
1000 labeling strips DIN A4, yellow, cardboard, preperforated, for inscription with laser printer	6ES7193-6LA10-0AG0	Color-coded labels for 20 mm wide BaseUnits	
BU cover		Color code CC41, for 16 process terminals, BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	6ES7193-6CP41-2MB0
for covering empty slots (gaps); 5 units		Color code CC81, for 4 AUX terminals, BU type B0, yellow-green (terminals 1 A to 4 A); 10 units	6ES7193-6CP81-2AB0
• 15 mm wide	6ES7133-6CV15-1AM0	Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A); 10 units	6ES7193-6CP82-2AB0
• 20 mm wide	6ES7133-6CV20-1AM0	Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A); 10 units	6ES7193-6CP83-2AB0
Shield connection	6ES7193-6SC00-1AM0		
5 shield supports and 5 shield terminals			

Overview



- 8 and 16-channel digital input modules for the ET 200SP
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type DI: white
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete article number
- Optional labeling accessories
 - Labeling strips
 - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection

Note:

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

Technical specifications

Article number	6AG1131-6BF00-7BA0	6AG1131-6BH00-7BA0
Based on	6ES7131-6BF00-0BA0 SIPLUS ET 200SP DI 8X24VDC ST	6ES7131-6BH00-0BA0 DI 16X24VDC ST
Ambient conditions		
Ambient temperature in operation		
• horizontal installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 6	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 4
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
Extended ambient conditions		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

SIPLUS digital input modules**Ordering data****Article No.****Article No.****SIPLUS digital input modules**

(Extended temperature range and medial exposure)

DI 8x24 V DC Standard,
BU type A0, color code CC01**6AG1131-6BF00-7BA0**DI 16x24 V DC Standard,
BU type A0, color code CC00**6AG1131-6BH00-7BA0****Supported SIPLUS BaseUnits****BU15-P16+A0+2D**

(Extended temperature range and medial exposure)

BU type A0; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA0**BU15-P16+A0+2B**

(Extended temperature range and medial exposure)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

6AG1193-6BP00-7BA0**BU15-P16+A10+2D**

(Extended temperature range and medial exposure)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

6AG1193-6BP20-7DA0**BU15-P16+A10+2B**

(Extended temperature range and medial exposure)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

6AG1193-6BP20-7BA0**Accessories**

See SIMATIC ET 200SP, digital input modules, page 9/19

Overview

- 4, 8 and 16-channel digital output modules for the ET 200SP
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type DQ: black
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete article number
- Optional labeling accessories
 - Labeling strips
 - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC

Note:

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

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules

SIPLUS digital output modules

Technical specifications

Article number	6AG1132-6BD20-7BA0	6AG1132-6BF00-7BA0	6AG1132-6BH00-7BA0
Based on	6ES7132-6BD20-0BA0 SIPLUS ET200SP DQ 4X24VDC/2A ST	6ES7132-6BF00-0BA0 SIPLUS ET200SP DQ 8X24VDC/0,5A ST	6ES7132-6BH00-0BA0 SIPLUS ET 200SP DQ 16X24VDC/0.5A ST
Ambient conditions			
Ambient temperature in operation			
• horizontal installation, min.	-40 °C	-40 °C; = Tmin	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax; > +60 °C number of simultaneously controllable outputs max. 2 x 0.25 A or max. 4 x 0.125 A, max. total current 0.5 A	70 °C; = Tmax; > +60 °C max. total current 1.0 A	70 °C; = Tmax; > +60 °C max. total current 1.0 A
• vertical installation, min.	-40 °C	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C	50 °C; = Tmax	50 °C; = Tmax
Extended ambient conditions			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data	Article No.	Article No.
SIPLUS digital output modules (Extended temperature range and medial exposure) DQ 4x24VDC/2A Standard, BU type A0, color code CC02 DQ 8x24VDC/0.5A Standard, BU type A0, color code CC02 DQ 16x24 V DC/0.5 A Standard, BU type A0, color code CC00	6AG1132-6BD20-7BA0 6AG1132-6BF00-7BA0 6AG1132-6BH00-7BA0	Supported SIPLUS BaseUnits BU15-P16+A0+2D (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A) 6AG1193-6BP00-7DA0 BU15-P16+A0+2B (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group 6AG1193-6BP00-7BA0 BU15-P16+A10+2D (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A) 6AG1193-6BP20-7DA0 BU15-P16+A10+2B (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group 6AG1193-6BP20-7BA0 Accessories See SIMATIC ET 200SP, digital output modules, page 9/28

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

Analog input modules

Overview



- 2, 4 and 8-channel AI modules
- Measuring range for current, voltage, thermocouples, resistance thermometers, resistors, and PTC
- BaseUnits for 2, 3 and 4-wire connection
- Function classes Basic, Standard, High-Feature and High-Speed
- Clear labeling on front of module
- LEDs for diagnostics, status, and error
- Individual system-integrated load group formation with self-assembling voltage busbars (power module not required for ET 200SP), electronically readable rating plate (I&M data)
- Partially with additional operating modes
- Optional accessories
 - Labeling strips
 - Equipment marking label
 - Color-coded label with module-specific CC code
 - Shield terminal

Overview of analog input modules

Analog input	Article number	CC code	BU type	PU
AI 8 x I 2-/4-wire BA	6ES7134-6GF00-0AA1	CC01	A0, A1	1
AI 8 x U BA	6ES7134-6FF00-0AA1	CC02	A0, A1	1
AI 4 x U/I 2-wire ST	6ES7134-6HD00-0BA1	CC03	A0, A1	1
AI 4 x I 2-/4-wire ST	6ES7134-6GD00-0BA1	CC03	A0, A1	1
AI 4 x I 2-wire 4...20 mA HART	6ES7134-6TD00-0CA1	CC03	A0, A1	1
AI 2 x U/I 2-/4-wire HF	6ES7134-6HB00-0CA1	CC05	A0, A1	1
AI 2xU/I 2-/4-wire HS	6ES7134-6HB00-0DA1	CC00	A0, A1	1
With two operating modes				
• High-speed isochronous AI				
• Oversampling				
AI 8 x RTD/TC 2-wire HF	6ES7134-6JF00-0CA1	CC00	A0, A1	1
AI 4 x RTD/TC 2-/3-/4-wire HF	6ES7134-6JD00-0CA1	CC00	A0, A1	1
AI Energy Meter AC 400 V ST	6ES7134-6PA00-0BD0	--	D0	1

Overview (continued)

Overview of BaseUnits

BaseUnit	Article number	CC codes for process terminals	CC codes for AUX terminals	PU
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10
BU type A1 • New load group (light) • With temperature sensor • 16 process terminals • With 2x5 add-on terminals	6ES7193-6BP40-0DA1	CC01 to CC05	CC74	1
BU type A1 • New load group (light) • With temperature sensor • 16 process terminals • Without 2x5 add-on terminals	6ES7193-6BP00-0DA1	CC01 to CC05	--	1
BU type A1 • Forwarding of load group (dark) • With temperature sensor • 16 process terminals • With 2x5 add-on terminals	6ES7193-6BP40-0BA1	CC01 to CC05	CC74	1
BU type A1 • Forwarding of load group (dark) • With temperature sensor • 16 process terminals • Without 2x5 add-on terminals	6ES7193-6BP00-0BA1	CC01 to CC05	--	1
BU type D0 • Forwarding of load group (dark) • 12 process terminals • Without AUX terminals	6ES7193-6BP00-0BD0	--	--	1

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

Analog input modules

Technical specifications

Article number	6ES7134-6HD00-0BA1 AI 4XU/I 2-WIRE ST	6ES7134-6GD00-0BA1 AI 4XI 2-/4-WIRE ST	6ES7134-6JD00-0CA1 AI 4XRTD/TC 2-/3-/4-WIRE HF	6ES7134-6TD00-0CA1 AI 4XI 2-WIRE 4...20MA HART
Product type designation				
General information				
Product function				
• I&M data	Yes	Yes	Yes; I&M0 to I&M3	Yes
• Scalable measuring range	No			No
Engineering with				
• STEP 7 TIA Portal can be configured/integrated as of version	V11 SP2 / V13	V11 SP2 / V13	V12 SP1 / V13	V13 SP1
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / V5.5 SP4	V5.5 SP4 and higher
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	GSDML V2.3	GSDML V2.31
Operating mode				
• Oversampling	No			No
• MSI	No			No
CiR - Configuration in RUN				
Reparameterization possible in RUN	Yes		Yes	Yes
Calibration possible in RUN	No		Yes	No
Supply voltage				
Type of supply voltage	DC			DC
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Analog inputs				
Number of analog inputs	4	4	4	4
permissible input voltage for voltage input (destruction limit), max.	30 V		30 V	
Constant measurement current for resistance-type transmitter, typ.			2 mA	
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary	Yes
Technical unit for temperature measurement adjustable			Yes	
Input ranges (rated values), voltages				
• 0 to +10 V	Yes; 15 bit			
• 1 V to 5 V	Yes; 15 bit			
• -1 V to +1 V			Yes; 16 bit incl. sign	
• -10 V to +10 V	Yes; 16 bit incl. sign			
• -250 mV to +250 mV			Yes; 16 bit incl. sign	
• -5 V to +5 V	Yes; 16 bit incl. sign			
• -50 mV to +50 mV			Yes; 16 bit incl. sign	
• -80 mV to +80 mV			Yes; 16 bit incl. sign	

Technical specifications (continued)

Article number	6ES7134-6HD00-0BA1 AI 4XU/I 2-WIRE ST	6ES7134-6GD00-0BA1 AI 4XI 2-/4-WIRE ST	6ES7134-6JD00-0CA1 AI 4XRTD/TC 2-/3-/4-WIRE HF	6ES7134-6TD00-0CA1 AI 4XI 2-WIRE 4...20mA HART
Input ranges (rated values), currents				
• 0 to 20 mA	Yes; 15 bit	Yes; 15 bit		No
• -20 mA to +20 mA		Yes; 16 bit incl. sign		No
• 4 mA to 20 mA	Yes; 15 bit	Yes; 15 bit		Yes; 15 bits + sign
Input ranges (rated values), thermoelements				
• Type B			Yes; 16 bit incl. sign	
• Type C			Yes; 16 bit incl. sign	
• Type E			Yes; 16 bit incl. sign	
• Type J			Yes; 16 bit incl. sign	
• Type K			Yes; 16 bit incl. sign	
• Type L			Yes; 16 bit incl. sign	
• Type N			Yes; 16 bit incl. sign	
• Type R			Yes; 16 bit incl. sign	
• Type S			Yes; 16 bit incl. sign	
• Type T			Yes; 16 bit incl. sign	
• Type U			Yes; 16 bit incl. sign	
• Type TXK/TXK(L) to GOST			Yes; 16 bit incl. sign	
Input ranges (rated values), resistance thermometer				
• Cu 10			Yes; 16 bit incl. sign	
• Ni 100			Yes; 16 bit incl. sign	
• Ni 1000			Yes; 16 bit incl. sign	
• LG-Ni 1000			Yes; 16 bit incl. sign	
• Ni 120			Yes; 16 bit incl. sign	
• Ni 200			Yes; 16 bit incl. sign	
• Ni 500			Yes; 16 bit incl. sign	
• Pt 100			Yes; 16 bit incl. sign	
• Pt 1000			Yes; 16 bit incl. sign	
• Pt 200			Yes; 16 bit incl. sign	
• Pt 500			Yes; 16 bit incl. sign	
Input ranges (rated values), resistors				
• 0 to 150 ohms			Yes; 15 bit	
• 0 to 300 ohms			Yes; 15 bit	
• 0 to 600 ohms			Yes; 15 bit	
• 0 to 3000 ohms			Yes; 15 bit	
• 0 to 6000 ohms			Yes; 15 bit	
• PTC			Yes; 15 bit	
Thermocouple (TC)				
• Technical unit for temperature measurement			°C/°F/K	
Temperature compensation				
- Parameterizable			Yes	
Resistance thermometer (RTD)				
• permissible input voltage for voltage input (destruction limit), max.			30 V	
• Technical unit for temperature measurement			°C/°F/K	
Cable length				
• shielded, max.	1 000 m; 200 m for voltage measurement	1 000 m	200 m; 50 m with thermocouples	800 m

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

Analog input modules

Technical specifications (continued)

Article number	6ES7134-6HD00-0BA1 AI 4XU/I 2-WIRE ST	6ES7134-6GD00-0BA1 AI 4XI 2-/4-WIRE ST	6ES7134-6JD00-0CA1 AI 4XRTD/TC 2-/3-/4-WIRE HF	6ES7134-6TD00-0CA1 AI 4XI 2-WIRE 4...20MA HART
Analog value generation for the inputs				
Integration and conversion time/ resolution per channel				
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes	Yes; channel by channel
• Basic conversion time, including integration time (ms)				
- additional processing time for wire-break check			2 ms; In the ranges resistance thermometers, resistors and thermocouples	
- additional power line wire-break check			2 ms; for 3/4 wire transducer (resistance thermometer and resistor)	
• Interference voltage suppression for interference frequency f_1 in Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz	10 / 50 / 60 Hz
• Conversion time (per channel)	180 / 60 / 50 ms	180 / 60 / 50 ms	180 / 60 / 50 ms	
Smoothing of measured values				
• Number of levels	4			4
• Parameterizable	Yes	Yes	Yes	Yes
Encoder				
Connection of signal encoders				
• for voltage measurement	Yes		Yes	No
• for current measurement as 2-wire transducer	Yes	Yes		Yes
- Burden of 2-wire transmitter, max.	650 Ω	650 Ω		
• for current measurement as 4-wire transducer	No	Yes		
• for resistance measurement with two-wire connection			Yes	
• for resistance measurement with three-wire connection			Yes	
• for resistance measurement with four-wire connection			Yes	
Errors/accuracies				
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input area, (+/-)	0.3 %		0.05 %	
• Current, relative to input area, (+/-)	0.3 %	0.3 %		0.3 %
• Resistance, relative to input area, (+/-)			0.05 %	
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, $f_1 =$ interference frequency				
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	70 dB	70 dB	60 dB
• common mode voltage, max.	10 V	10 V	10 V	
• Common mode interference, min.	90 dB	90 dB	90 dB	

Technical specifications (continued)

Article number	6ES7134-6HD00-0BA1 AI 4XU/I 2-WIRE ST	6ES7134-6GD00-0BA1 AI 4XI 2-/4-WIRE ST	6ES7134-6JD00-0CA1 AI 4XR TD/TC 2-/3-/4-WIRE HF	6ES7134-6TD00-0CA1 AI 4XI 2-WIRE 4...20mA HART
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No			No
Interrupts/diagnostics/ status information				
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	No		Yes; two upper and two lower limit values in each case	Yes
Diagnostic messages				
• Diagnostics		Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire break	Yes; at 4 to 20 mA	Yes; at 4 to 20 mA	Yes; channel by channel	Yes; channel by channel
• Short circuit	Yes; with 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply		Yes; Channel-by-channel, short-circuit of the encoder supply to ground or of an input to the encoder supply
• Group error	Yes			
• Overflow/underflow	Yes	Yes	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No		Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Green/red LED	Yes; Green/red LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Electrical isolation channels				
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
Isolation				
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
Ambient conditions				
Ambient temperature in operation				
• horizontal installation, min.		0 °C		
• horizontal installation, max.		60 °C		
• vertical installation, min.		0 °C		
• vertical installation, max.		50 °C		
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Weights				
Weight, approx.	31 g	31 g	30 g	31 g

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

Analog input modules

Technical specifications (continued)

Article number	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-WIRE HS	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-WIRE HF	6ES7134-6JF00-0CA1 AI 8XRTD/TC 2-WIRE HF
Product type designation			
General information			
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Scalable measuring range	No	No	
Engineering with			
• STEP 7 TIA Portal can be configured/integrated as of version	V13 SP1	V13	V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 / -
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode			
• Oversampling	Yes	No	
• MSI	No	No	
CiR - Configuration in RUN			
Reparameterization possible in RUN	Yes	Yes	Yes
Calibration possible in RUN	No	Yes	Yes
Supply voltage			
Type of supply voltage	DC	DC	
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Analog inputs			
Number of analog inputs	2	2	8
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V	30 V
Constant measurement current for resistance-type transmitter, typ.			2 mA
Cycle time (all channels), min.	125 µs		Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)
Technical unit for temperature measurement adjustable			Yes
Input ranges (rated values), voltages			
• 0 to +10 V	Yes; 15 bit	Yes; 15 bit	
• 1 V to 5 V	Yes; 13 bit	Yes; 15 bit	
• -1 V to +1 V			Yes; 16 bit incl. sign
• -10 V to +10 V	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• -250 mV to +250 mV			Yes; 16 bit incl. sign
• -5 V to +5 V	Yes; 15 bit incl. sign	Yes; 16 bit incl. sign	
• -50 mV to +50 mV			Yes; 16 bit incl. sign
• -80 mV to +80 mV			Yes; 16 bit incl. sign

Technical specifications (continued)

Article number	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-WIRE HS	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-WIRE HF	6ES7134-6JF00-0CA1 AI 8XRTD/TC 2-WIRE HF
Input ranges (rated values), currents			
• 0 to 20 mA	Yes; 15 bit	Yes; 15 bit	
• -20 mA to +20 mA	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• 4 mA to 20 mA	Yes; 14 bit	Yes; 15 bit	
Input ranges (rated values), thermoelements			
• Type B			Yes; 16 bit incl. sign
• Type C			Yes; 16 bit incl. sign
• Type E			Yes; 16 bit incl. sign
• Type J			Yes; 16 bit incl. sign
• Type K			Yes; 16 bit incl. sign
• Type L			Yes; 16 bit incl. sign
• Type N			Yes; 16 bit incl. sign
• Type R			Yes; 16 bit incl. sign
• Type S			Yes; 16 bit incl. sign
• Type T			Yes; 16 bit incl. sign
• Type U			Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST			Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer			
• Ni 100			Yes; 16 bit incl. sign
• Ni 1000			Yes; 16 bit incl. sign
• LG-Ni 1000			Yes; 16 bit incl. sign
• Ni 120			Yes; 16 bit incl. sign
• Ni 200			Yes; 16 bit incl. sign
• Ni 500			Yes; 16 bit incl. sign
• Pt 100			Yes; 16 bit incl. sign
• Pt 1000			Yes; 16 bit incl. sign
• Pt 200			Yes; 16 bit incl. sign
• Pt 500			Yes; 16 bit incl. sign
Input ranges (rated values), resistors			
• 0 to 150 ohms			Yes; 15 bit
• 0 to 300 ohms			Yes; 15 bit
• 0 to 600 ohms			Yes; 15 bit
• 0 to 3000 ohms			Yes; 15 bit
• 0 to 6000 ohms			Yes; 15 bit
• PTC			Yes; 15 bit
Thermocouple (TC)			
• Technical unit for temperature measurement			°C/°F/K
Temperature compensation			
- Parameterizable			Yes
Resistance thermometer (RTD)			
• permissible input voltage for voltage input (destruction limit), max.			30 V
• Technical unit for temperature measurement			°C/°F/K
Cable length			
• shielded, max.	1 000 m; 200 m for voltage measurement	1 000 m; 200 m for voltage measurement	200 m; 50 m with thermocouples

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

Analog input modules

Technical specifications (continued)

Article number	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-WIRE HS	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-WIRE HF	6ES7134-6JF00-0CA1 AI 8XRTD/TC 2-WIRE HF
Analog value generation for the inputs			
Integration and conversion time/resolution per channel			
<ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. Integration time, parameterizable Basic conversion time, including integration time (ms) <ul style="list-style-type: none"> - additional processing time for wire-break check 	16 bit	16 bit	16 bit
<ul style="list-style-type: none"> Interference voltage suppression for interference frequency f1 in Hz Conversion time (per channel) Basic execution time of the module (all channels released) 	No 10 µs	Yes 1 ms	Yes 2 ms; In the ranges resistance thermometers, resistors and thermocouples 16.6 / 50 / 60 Hz 180 / 60 / 50 ms
Smoothing of measured values			
<ul style="list-style-type: none"> Number of levels Parameterizable 	7; none; 2-/4-/8-/16-/32-/64-fold Yes	6; none; 2-/4-/8-/16-/32-fold Yes	Yes
Encoder			
Connection of signal encoders			
<ul style="list-style-type: none"> for voltage measurement for current measurement as 2-wire transducer <ul style="list-style-type: none"> - Burden of 2-wire transmitter, max. for current measurement as 4-wire transducer for resistance measurement with two-wire connection for resistance measurement with three-wire connection for resistance measurement with four-wire connection 	Yes Yes 650 Ω Yes	Yes Yes 650 Ω Yes	Yes Yes No No
Errors/accuracies			
Basic error limit (operational limit at 25 °C)			
<ul style="list-style-type: none"> Voltage, relative to input area, (+/-) Current, relative to input area, (+/-) Resistance, relative to input area, (+/-) 	0.2 % 0.2 %	0.05 %; 0.1 % at SFU 4.8 kHz 0.05 %; 0.1 % at SFU 4.8 kHz	0.05 % 0.05 %
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$, f1 = interference frequency			
<ul style="list-style-type: none"> Series mode interference (peak value of interference < rated value of input range), min. common mode voltage, max. Common mode interference, min. 	35 V 90 dB	35 V 90 dB	70 dB 10 V 90 dB
Isochronous mode			
<ul style="list-style-type: none"> Isochronous operation (application synchronized up to terminal) Filtering and processing time (TCI), min. Bus cycle time (TDP), min. 	Yes 80 µs 125 µs	Yes 800 µs 1 ms	

Technical specifications (continued)

Article number	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-WIRE HS	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-WIRE HF	6ES7134-6JF00-0CA1 AI 8XRTD/TC 2-WIRE HF
Interrupts/diagnostics/status information			
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnostic messages			
• Diagnostics	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes; channel-by-channel, at 4 to 20 mA only	Yes; Measuring range 4 to 20 mA only	Yes; channel by channel
• Short circuit	Yes; channel-by-channel, at 1 to 5 V or for current measuring ranges short-circuit in encoder supply	Yes; For 1 to 5 V or for current measuring ranges short-circuit in encoder supply	
• Overflow/underflow	Yes	Yes	Yes; channel by channel
Diagnostics indication LED			
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Electrical isolation channels			
• between the channels and the backplane bus	Yes	Yes	Yes
Isolation			
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
Dimensions			
Width	15 mm	15 mm	15 mm
Weights			
Weight, approx.	32 g	32 g	32 g
Article number	6ES7134-6PA00-0BD0 ET 200SP AI ENERGY METER ST	Article number	6ES7134-6PA00-0BD0 ET 200SP AI ENERGY METER ST
Product type designation		Supply voltage	
General information		Description	Supply via voltage measurement channel L1
Supported BaseUnits	BU type D0, BU20-P12+A0+0B	Type of supply voltage	100 - 240 V AC
Color code for module-specific color identification plate	CC00	Relative symmetrical tolerance of the supply voltage	10 %
Product function		permissible range, lower limit (AC)	90 V
• Voltage measurement	Yes	permissible range, upper limit (AC)	264 V
• Current measurement	Yes	Line frequency	
• Energy measurement	Yes	• permissible frequency range, lower limit	47 Hz
• Frequency measurement	Yes	• permissible frequency range, upper limit	63 Hz
• Active power measurement	Yes	Power	
• Reactive power measurement	Yes	Power consumption without expansion module, typ.	0.6 V·A
• I&M data	Yes		
• Isochronous mode	No		
Operating mode			
• Cyclic measurement	Yes		
• Acyclic measurement	Yes		
Installation type/mounting			
Mounting position	Any		

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules

Analog input modules

Technical specifications (continued)

Article number	6ES7134-6PA00-0BD0 ET 200SP AI ENERGY METER ST
Address area	
Address space per module	
• Address space per module, max.	44 byte; 32 byte input / 12 byte output
Analog inputs	
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	24 bit; Sigma-delta converter, 1.024 MHz
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	No
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes
• Channel status display	Yes
• for channel diagnostics	Yes
• for module diagnostics	Yes
Integrated Functions	
Measuring functions	
• Buffering of measured variables	No
• Parameter length	44 byte
• Measuring procedure for voltage measurement	TRMS
• Measuring procedure for current measurement	TRMS
• Type of measured value acquisition	seamless
• Curve shape of voltage	Sinusoidal or distorted
Operating mode for measured value acquisition	
- Automatic detection of line frequency	No; Parameterizable
- Fixation to 50 Hz	No; Default setting
- Fixation to 60 Hz	No
Measuring range	
- Frequency measurement, min.	45 Hz
- Frequency measurement, max.	65 Hz
Measuring inputs for voltage	
- Measurable line voltage between phase and neutral conductor	230 V
- Measurable line voltage between the line conductors	400 V
- Measurable line voltage between phase and neutral conductor, min.	90 V
- Measurable line voltage between phase and neutral conductor, max.	264 V
- Measurable line voltage between the line conductors, min.	155 V
- Measurable line voltage between the line conductors, max.	460 V
- Measurement category for voltage measurement	CAT III acc. to IEC 61010 Part 1
- Power consumption per phase	20 mW

Article number	6ES7134-6PA00-0BD0 ET 200SP AI ENERGY METER ST
Integrated Functions (continued)	
Measuring inputs for current	
- Measurable relative current (AC), min.	5 %; Relative to the secondary rated current; 1 A, 5 A
- Measurable relative current (AC), max.	100 %; Relative to the secondary rated current; 1 A, 5 A
- Continuous current (AC), maximum permissible	5 A
- Apparent power consumption per phase for measuring range 5 A	0.6 V·A
- Rated value short-time withstand current restricted to 1 s	100 A
- Zero point suppression	Parameterizable: 20 - 250 mA, default 50 mA
- Surge strength for 1 s	10 A; for 1 minute
Meter uncertainties	
- Reference condition for measurement accuracy	Symmetric load, rated current: 20-100%, 50 Hz; active power: LF = 1, reactive power: LF = 0
- for measured variable voltage	±0.5%
- for measured variable current	±0.5%
- for measured variable power	±0.5%
- for measured variable active power	±0.5%
- for measured variable reactive power	±0.5%
- for measured variable total active energy	Class 1 acc. to IEC 62053-21:2003
- for measured variable total reactive energy	Class 2 acc. to IEC 62053-23:2003
Dimensions	
Width	20 mm
Weights	
Weight (without packaging)	45 g
other	
Data for selecting a current transformer	
• Burden power current transformer x/1A, min.	1.25 V·A
• Burden power current transformer x/5A, min.	1.5 V·A
• Cable length (terminal-transformer) dependent on Zn and I _{max}	200 m

Ordering data	Article No.	Article No.
Analog input modules		Supported type A0 BaseUnits
Analog input module AI 8xI 2-/4-wire BA, BU type A0 or A1, color code CC01	6ES7134-6GF00-0AA1	BU15-P16+A10+2D
Analog input module AI 8xU BA, BU type A0 or A1, color code CC02	6ES7134-6FF00-0AA1	BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 inter- nally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)
Analog input module AI 4xU/I 2-wire Standard, BU type A0 or A1, color code CC03, 16 bit, ± 0.3%	6ES7134-6HD00-0BA1	<ul style="list-style-type: none"> • 1 unit • 10 units
Analog input module AI 4xI 2-/4-wire Standard, BU type A0 or A1, color code CC03, 16 bit, ± 0.3%	6ES7134-6GD00-0BA1	BU15-P16+A0+2D
Analog input module AI 4xI 2-wire 4...20 mA HART, BU type A0 or A1, color code CC03	6ES7134-6TD00-0CA1	BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)
Analog input module AI 2xU/I 2-/4-wire High Feature, BU type A0 or A1, color code CC05, 16 bit, ± 0.1%, independent channel isolation, isochronous mode above 1 ms	6ES7134-6HB00-0CA1	<ul style="list-style-type: none"> • 1 unit • 10 units
Analog input module AI 2xU/I 2-/4-wire High Speed, BU type A0 or A1, color code CC00, 16 bit, ± 0.3%, isochronous mode above 250 µs, oversampling above 50 µs	6ES7134-6HB00-0DA1	BU15-P16+A10+2B
Analog input module AI 8xRTD/TC 2-wire High Feature, BU type A0 or A1, color code CC00, 16 bit, ± 0.1%, scalable measuring range	6ES7134-6JF00-0CA1	BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 inter- nally jumpered AUX terminals (1 A to 10 A); for continuing the load group
Analog input module AI 4xRTD/TC 2-, 3-, 4-wire High Feature, BU type A0 or A1, color code CC00, 16 bit, ± 0.1%, scalable measuring range	6ES7134-6JD00-0CA1	<ul style="list-style-type: none"> • 1 unit • 10 units
Analog input module AI Energy Meter Standard, BU type D0	6ES7134-6PA00-0BD0	BU15-P16+A0+2B
		BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group
		<ul style="list-style-type: none"> • 1 unit • 10 units
		6ES7193-6BP00-0DA0 6ES7193-6BP20-2DA0
		6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0
		6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0
		6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

Analog input modules

Ordering data	Article No.	Accessories	Article No.
Supported type A1 BaseUnits (temperature detection)		Reference identification label	6ES7193-6LF30-0AW0
BU15-P16+A0+12D/T BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and additionally 2x5 internally jumpered add-on terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	6ES7193-6BP40-0DA1	10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit	
BU15-P16+A0+2D/T BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	6ES7193-6BP00-0DA1	Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0
BU15-P16+A0+12B/T BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered add-on terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	6ES7193-6BP40-0BA1	500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0
BU15-P16+A0+2B/T BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6ES7193-6BP00-0BA1	1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer	6ES7193-6LA10-0AA0
Supported type D0 BaseUnits		1000 labeling strips DIN A4, yellow, cardboard, preperforated, for inscription with laser printer	6ES7193-6LA10-0AG0
BU20-P12+A0+0B BU type D0; BaseUnit with 12 push-in terminals, without AUX terminals, bridged to the left	6ES7193-6BP00-0BD0	BU cover for covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0
		Shield connection 5 shield supports and 5 shield terminals	6ES7193-6SC00-1AM0
		Color-coded labels Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	6ES7193-6CP00-2MA0
		Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	6ES7193-6CP01-2MA0
		Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), blue (terminals 9 to 16), 10 units	6ES7193-6CP02-2MA0
		Color code CC03, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), gray (terminals 13 to 16); 10 units	6ES7193-6CP03-2MA0
		Color code CC05, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 12), red (terminals 13 to 14), blue (terminals 15 to 16); 10 units	6ES7193-6CP05-2MA0
		Color code CC71, for 10 AUX terminals, BU type A0, yellow-green (terminals 1 A to 10 A); 10 units	6ES7193-6CP71-2AA0
		Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	6ES7193-6CP72-2AA0
		Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	6ES7193-6CP73-2AA0
		Color code CC74, for 2x5 add-on terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units	6ES7193-6CP74-2AA0

Overview



- 2 and 4-channel AQ modules
- Output ranges for current, voltage
- BaseUnits for 2, 3 and 4-wire connection
- Function classes Standard, High-Feature and High-Speed
- Clear labeling on front of module
- LEDs for diagnostics, status, and error
- Individual system-integrated load group formation with self-assembling voltage busbars (power module not required for ET 200SP)
- Electronically readable rating plate (I&M data)
- Partially with additional operating modes
- Optional accessories
 - Labeling strips
 - Equipment marking label
 - Color-coded label with module-specific CC code
 - Shield terminal

Overview of analog output modules

Analog input	Article number	CC code	BU type	PU
AQ 4 x U/I ST	6ES7135-6HD00-0BA1	CC00	A0, A1	1
AQ 2 x U/I HF	6ES7135-6HB00-0CA1	CC00	A0, A1	1
AQ 2xU/I HS	6ES7135-6HB00-0DA1	CC00	A0, A1	1

With two operating modes

- High-speed isochronous AQ
- Oversampling

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

Analog output modules**Overview** (continued)

Overview of BaseUnits

BaseUnit	Article number	CC codes for process terminals	CC codes for AUX terminals	PU
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10
BU type A1 • New load group (light) • With temperature sensor • 16 process terminals • With 2x5 add-on terminals	6ES7193-6BP40-0DA1	CC01 to CC05	CC74	1
BU type A1 • New load group (light) • With temperature sensor • 16 process terminals • Without 2x5 add-on terminals	6ES7193-6BP00-0DA1	CC01 to CC05	--	1
BU type A1 • Forwarding of load group (dark) • With temperature sensor • 16 process terminals • With 2x5 add-on terminals	6ES7193-6BP40-0BA1	CC01 to CC05	CC74	1
BU type A1 • Forwarding of load group (dark) • With temperature sensor • 16 process terminals • Without 2x5 add-on terminals	6ES7193-6BP00-0BA1	CC01 to CC05	--	1

Technical specifications

Article number	6ES7135-6HD00-0BA1 AQ 4XU/I ST	6ES7135-6HB00-0DA1 ET 200SP AQ 2 X U/I HIGH SPEED	6ES7135-6HB00-0CA1 ET 200SP AQ 2 X U/I HIGH FEATURE
Product type designation			
General information			
Product function			
• I&M data	Yes	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with			
• STEP 7 TIA Portal can be configured/integrated as of version	V11 SP2 / V13	V12 SP1 / V13	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/GSD revision	V2.3 / -	GSDML V2.3	GSDML V2.3
Operating mode			
• Oversampling		Yes; 1 channel per module	
CiR - Configuration in RUN			
Reparameterization possible in RUN	Yes	Yes	Yes
Calibration possible in RUN		Yes	Yes
Supply voltage			
Type of supply voltage	DC	DC	DC
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes		
Analog outputs			
Number of analog outputs	4	2	2
Cycle time (all channels), min.	5 ms	125 µs	750 µs
Output ranges, voltage			
• 0 to 10 V	Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• 1 V to 5 V	Yes; 13 bit	Yes; 13 bit	Yes; 13 bit
• -5 V to +5 V	Yes; 15 bit incl. sign	Yes; 15 bit incl. sign	Yes; 15 bit incl. sign
• -10 V to +10 V	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Output ranges, current			
• 0 to 20 mA	Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 14 bit	Yes; 14 bit	Yes; 14 bit
Connection of actuators			
• for voltage output two-wire connection	Yes	Yes	Yes
• for voltage output four-wire connection	Yes	Yes	Yes
• for current output two-wire connection	Yes	Yes	Yes
Load impedance (in rated range of output)			
• with voltage outputs, min.	2 kΩ	2 kΩ	2 kΩ
• with voltage outputs, capacitive load, max.	1 µF	1 µF	1 µF
• with current outputs, max.	500 Ω	500 Ω	500 Ω
• with current outputs, inductive load, max.	1 mH	1 mH	1 mH
Cable length			
• shielded, max.	1 000 m; 200 m for voltage output	200 m	1 000 m; 200 m for voltage output

I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

Analog output modules

Technical specifications (continued)

Article number	6ES7135-6HD00-0BA1 AQ 4XU/I ST	6ES7135-6HB00-0DA1 ET 200SP AQ 2 X U/I HIGH SPEED	6ES7135-6HB00-0CA1 ET 200SP AQ 2 X U/I HIGH FEATURE
Analog value generation for the outputs			
Integration and conversion time/resolution per channel			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
Settling time			
• for resistive load	0.1 ms	0.05 ms	0.05 ms
• for capacitive load	1 ms	0.05 ms	0.05 ms
• for inductive load	0.5 ms	0.05 ms	0.05 ms
Errors/accuracies			
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to output area, (+/-)	0.3 %	0.1 %	0.1 %
• Current, relative to output area, (+/-)	0.3 %	0.1 %	0.1 %
Isochronous mode			
Isochronous operation (application synchronized up to terminal)		Yes	Yes
Execution and activation time (TCO), min.		130 µs	500 µs
Bus cycle time (TDP), min.		250 µs	750 µs
Interrupts/diagnostics/status information			
Substitute values connectable	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnostic messages			
• Diagnostics	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes	Yes; channel-by-channel, only for output type "current"	Yes; channel-by-channel, only for output type "current"
• Short circuit	Yes	Yes; channel-by-channel, only for output type "voltage"	Yes; channel-by-channel, only for output type "voltage"
• Overflow/underflow	Yes	Yes	Yes
Diagnostics indication LED			
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics		Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Green/red LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Electrical isolation channels			
• between the channels and the backplane bus	Yes	Yes	Yes
Isolation			
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
Ambient conditions			
Ambient temperature in operation			
• horizontal installation, min.	0 °C	0 °C	
• horizontal installation, max.	60 °C	60 °C	
• vertical installation, min.	0 °C	0 °C	
• vertical installation, max.	50 °C	50 °C	
Dimensions			
Width	15 mm	15 mm	15 mm
Weights			
Weight, approx.	31 g	31 g	31 g

Ordering data	Article No.	Article No.
Analog output modules		Accessories
Analog output module AQ 4xU/I Standard, BU type A0 or A1, color code CC00, 16 bit, ± 0.3%	6ES7135-6HD00-0BA1	Reference identification label 6ES7193-6LF30-0AW0
Analog output module AQ 2xU/I High Feature, BU type A0 or A1, color code CC00, 16 bit, ± 0.1%	6ES7135-6HB00-0CA1	10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit
Analog output module AQ 2xU/I High Speed, BU type A0 or A1, color code CC00, 16 bit, ± 0.3%	6ES7135-6HB00-0DA1	Labeling strips
Supported type A0 BaseUnits		500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer
BU15-P16+A10+2D		500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer
• 1 unit		6ES7193-6LR10-0AA0
• 10 units		6ES7193-6LR10-0AG0
BU15-P16+A0+2D		1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	1000 labeling strips DIN A4, yellow, cardboard, preperforated, for inscription with laser printer
• 1 unit		6ES7193-6LA10-0AA0
• 10 units		6ES7193-6LA10-0AG0
BU15-P16+A10+2B		BU cover
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0	for covering empty slots (gaps); 5 units
• 1 unit		• 15 mm
• 10 units		• 20 mm
BU15-P16+A0+2B		Shield connection 6ES7193-6SC00-1AM0
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0	5 shield supports and 5 shield terminals
• 1 unit		Color-coded labels
• 10 units		Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units
Supported type A1 BaseUnits (temperature detection)		Color code CC71, for 10 AUX terminals, BU type A0, yellow-green (terminals 1 A to 10 A); 10 units
BU15-P16+A0+12D/T	6ES7193-6BP40-0DA1	Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units
BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and additionally 2x5 internally jumpered add-on terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)		Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units
BU15-P16+A0+2D/T	6ES7193-6BP00-0DA1	Color code CC74, for 2x5 add-on terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units
BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)		6ES7193-6CP00-2MA0
BU15-P16+A0+12B/T	6ES7193-6BP40-0BA1	6ES7193-6CP71-2AA0
BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered add-on terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group		6ES7193-6CP72-2AA0
BU15-P16+A0+2B/T	6ES7193-6BP00-0BA1	6ES7193-6CP73-2AA0
BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group		6ES7193-6CP74-2AA0

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules

SIPLUS analog input modules

Overview



- 4-channel analog input modules for the ET 200SP

Can be plugged into type A0 or A1 BaseUnits (BU) with automatic coding

- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type AI: light blue
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete article number
- Optional labeling accessories
 - Labeling strips
 - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection

Note:

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

Technical specifications

Article number	6AG1134-6HD00-7BA1	6AG1134-6GD00-7BA1	6AG1134-6JD00-2CA1
Based on	6ES7134-6HD00-0BA1	6ES7134-6GD00-0BA1	6ES7134-6JD00-0CA1
	SIPLUS ET 200SP AI 4XU/I 2-WIRE ST	SIPLUS ET 200SP AI 4XI 2-/4-WIRE ST	SIPLUS ET 200SP AI 4XRTD/TC HF
Ambient conditions			
Ambient temperature in operation			
• horizontal installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C
• horizontal installation, max.	70 °C; = Tmax; > 60 °C max. 1x +/- 20 mA or 4x +/- 10 V permissible	70 °C; = Tmax; > 60 °C max. 1x +/- 20 mA permissible	60 °C
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C
Extended ambient conditions			
Relative humidity			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data	Article No.	Ordering data	Article No.
SIPLUS analog input modules (Extended temperature range and medial exposure) AI 4XU/I 2-wire Standard BU type A0 or A1, color code CC03 AI 4xI 2-, 4-wire Standard, BU type A0 or A1, color code CC03 AI 4xRTD/TC 2-, 3-, 4-wire High Feature BU type A0 or A1, color code CC00	6AG1134-6HD00-7BA1 6AG1134-6GD00-7BA1 6AG1134-6JD00-2CA1	Supported SIPLUS BaseUnits type A1 (temperature detection) BU15-P16+A0+2D/T (Extended temperature range and medial exposure) BU type A1; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A) BU15-P16+A0+2B/T (Extended temperature range and medial exposure) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group BU15-P16+A0+12D/T (Extended temperature range and medial exposure) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered AUX terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A) BU15-P16+A0+12B/T (Extended temperature range and medial exposure) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered AUX terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	6AG1193-6BP00-7DA1 6AG1193-6BP00-7BA1 6AG1193-6BP40-7DA1 6AG1193-6BP40-7BA1
Supported SIPLUS BaseUnits type A0 BU15-P16+A0+2D (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A) BU15-P16+A0+2B (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group BU15-P16+A10+2D (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A) BU15-P16+A10+2B (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	6AG1193-6BP00-7DA0 6AG1193-6BP00-7BA0 6AG1193-6BP20-7DA0 6AG1193-6BP20-7BA0	Accessories See SIMATIC ET 200SP, analog input modules, page 9/46	

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules

SIPLUS analog output modules

Overview



- 4-channel analog input modules for the ET 200SP
- Can be plugged into type A0 or A1 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type AQ: dark blue
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete article number
- Optional labeling accessories
 - Labeling strips
 - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection

Note:

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

Technical specifications

Article number	6AG1135-6HD00-7BA1
Based on	6ES7135-6HD00-0BA1 SIPLUS ET 200SP AQ 4XU/I ST
Ambient conditions	
Ambient temperature in operation	
• horizontal installation, min.	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax; > +60 °C max. 2x +/- 10 V permissible
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data	Article No.	Ordering data	Article No.
SIPLUS analog output modules (Extended temperature range and medial exposure) AQ 4XU/I Standard, BU type A0 or A1, color code CC03	6AG1135-6HD00-7BA1	Supported SIPLUS BaseUnits type A1 (temperature detection) BU15-P16+A0+2D/T (Extended temperature range and medial exposure) BU type A1; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA1
Supported SIPLUS BaseUnits type A0 BU15-P16+A0+2D (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA0	BU15-P16+A0+2B/T (Extended temperature range and medial exposure) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6AG1193-6BP00-7BA1
BU15-P16+A0+2B (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0	BU15-P16+A0+12D/T (Extended temperature range and medial exposure) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered AUX terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	6AG1193-6BP40-7DA1
BU15-P16+A10+2D (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	6AG1193-6BP20-7DA0	BU15-P16+A0+12B/T (Extended temperature range and medial exposure) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered AUX terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	6AG1193-6BP40-7BA1
BU15-P16+A10+2B (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	6AG1193-6BP20-7BA0	Accessories See SIMATIC ET 200SP, analog output modules, page 9/51	

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Technology modules

TM Count 1x24V counter module

Overview

Technical properties

- ET 200SP counter module
- Interfaces:
 - 24 V encoder signals A, B and N from P, M or push-pull-switching encoders and sensors
 - 24 V encoder supply output, short-circuit-proof
 - 3 digital inputs for controlling the count operation, for saving or for setting the count value
 - 2 digital outputs for fast responses regardless of the counter status or the measured value
- Counting frequency 200 kHz (800 kHz with quadruple evaluation)
- Counting range +/- 31 bit
- Measurement function
- Process interrupts, parameterizable
- Parameterizable input filter for suppressing faults at encoder and digital inputs

Supported encoders/signal types

- 24 V incremental encoder with and without signal N
- 24 V pulse encoder with direction signal
- 24 V pulse encoder without direction signal
- 24 V pulse encoder for pulse up and down respectively

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Technical specifications

Article number	6ES7138-6AA00-0BA0 ET 200SP, TM COUNT 1X24V
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / V5.5 SP4
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3
Installation type/mounting	
Rack mounting possible	Yes
Type of fitting, rail mounting	Yes
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
Input current	
Current consumption, max.	60 mA; without load
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	300 mA

Article number	6ES7138-6AA00-0BA0 ET 200SP, TM COUNT 1X24V
Power losses	
Power loss, typ.	1 W
Digital inputs	
Number of digital inputs	3
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
for counter/technological functions	
- Parameterizable	Yes
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	600 m

Technical specifications (continued)

Article number	6ES7138-6AA00-0BA0 ET 200SP, TM COUNT 1X24V
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, configurable	Yes
short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 μs
• "1" to "0", max.	50 μs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Aggregate current of the outputs	
• Current per module, max.	1 A
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Signal filter, can be parameterized	Yes
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Incremental encoder with A/B tracks, 90° out of phase and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes

Article number	6ES7138-6AA00-0BA0 ET 200SP, TM COUNT 1X24V
Encoder signal 24 V	
- Permissible voltage at input, min.	-30 V
- Permissible voltage at input, max.	30 V
Interface types	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
• m/p-reading	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• Short circuit	Yes
• A/B transition error at incremental encoder	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
Integrated Functions	
Number of counters	1
Counter frequency (counter) max.	800 kHz; with quadruple evaluation
Counting functions	
• Can be used with TO High_Speed_Counter	Yes
• Continuous counting	Yes
• Counter response can be parameterized	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
Comparator	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Technology modules

TM Count 1x24V counter module

Technical specifications (continued)

Article number	6ES7138-6AA00-0BA0 ET 200SP, TM COUNT 1X24V
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Period measurement, min.	1.25 µs
- Period measurement, max.	25 s
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Speed measurement	100 ppm; depending on measuring interval and signal evaluation
Electrical isolation channels	
• between the channels and the backplane bus	Yes
Permissible potential difference	
between different circuits	75 V DC/60 V AC (base isolation)
Isolation	
Isolation checked with	707 V DC (type test)
Dimensions	
Width	15 mm
Weights	
Weight, approx.	45 g

Ordering data

Ordering data	Article No.
TM Count 1x24V counter module	
With one channel, max. 200 kHz; for 24 V encoder	6ES7138-6AA00-0BA0
Supported BaseUnits	
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	6ES7193-6BP00-0DA0
• 10 units	6ES7193-6BP00-2DA0
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
• 1 unit	6ES7193-6BP00-0BA0
• 10 units	6ES7193-6BP00-2BA0

Ordering data

Ordering data	Article No.
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	6ES7193-6BP20-0DA0
• 10 units	6ES7193-6BP20-2DA0
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	6ES7193-6BP20-0BA0
• 10 units	6ES7193-6BP20-2BA0
Accessories	
Reference identification label	6ES7193-6LF30-0AW0
10 sheets of 16 labels	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	6ES7193-6LA10-0AA0
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0
BU cover	
for covering empty slots (gaps); 5 units	
• 15 mm wide	6ES7133-6CV15-1AM0
• 20 mm wide	6ES7133-6CV20-1AM0
Shield connection	6ES7193-6SC00-1AM0
5 shield supports and 5 shield terminals	
Color-coded labels	
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	6ES7193-6CP71-2AA0
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	6ES7193-6CP72-2AA0
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	6ES7193-6CP73-2AA0

Overview



Technical properties

- Counter and position recording module for ET 200SP
- Interfaces:
 - Encoder signals A, B and N for 5 V TTL or RS 422 differential signals
 - SSI interface with clock and data for RS 422 differential signals
 - 24 V encoder supply output, short-circuit proof
 - 2 digital inputs for controlling the counting process, for saving or setting the counter or position value
 - 2 digital outputs for fast reactions depending on the counter reading, position value or measured value
- Counter frequency 1 MHz (4 MHz with four-fold evaluation)
- Count range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

Supported types of encoders/signals

- Incremental encoders with or without N signal
- Pulse encoders with directional signal
- Pulse encoders without directional signal
- Pulse encoders for forward or reverse pulses
- SSI encoders with a frame length of 10 to 40 bits, of which up to 31 bits position value

Supported system functions

- Isochronous mode
- Firmware update
- Identification data (I&M)

Technical specifications

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM POSINPUT 1
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / V5.5 SP4
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3
Installation type/mounting	
Rack mounting possible	Yes
Type of fitting, rail mounting	Yes
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
Input current	
Current consumption, max.	75 mA; without load
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	300 mA
Power losses	
Power loss, typ.	1.9 W
Digital inputs	
Number of digital inputs	2
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Technology modules

TM PosInput 1 position recording module

Technical specifications (continued)

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM POSINPUT 1
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
for counter/technological functions	
- Parameterizable	Yes
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, configurable short-circuit protection	Yes
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM POSINPUT 1
Aggregate current of the outputs	
• Current per module, max.	1 A
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, can be parameterized	Yes
• Cable length, shielded, max.	32 m; at 1 MHz
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Incremental encoder with A/B tracks, 90° out of phase and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	5 V TTL (push-pull encoders only)
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, can be parameterized	Yes
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Incremental encoder with A/B tracks, 90° out of phase and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Message frame length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interface types	
• RS422	Yes
• TTL 5 V	Yes

Technical specifications (continued)

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM POSINPUT 1
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• Short circuit	Yes
• A/B transition error at incremental encoder	Yes
• Frame error at SSI encoder	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
Integrated Functions	
Number of counters	1
Counter frequency (counter) max.	4 MHz; with quadruple evaluation
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response can be parameterized	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
Comparator	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM POSINPUT 1
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Period measurement, min.	0.25 µs
- Period measurement, max.	25 s
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Speed measurement	100 ppm; depending on measuring interval and signal evaluation
Electrical isolation channels	
• between the channels and the backplane bus	Yes
Permissible potential difference	
between different circuits	75 V DC/60 V AC (base isolation)
Isolation	
Isolation checked with	707 V DC (type test)
Ambient conditions	
Ambient temperature in operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C; Observe derating
Dimensions	
Width	15 mm
Weights	
Weight, approx.	45 g

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Technology modules

TM PosInput 1 position recording module

Ordering data

Article No.

TM PosInput 1 counter and position recording module

With one channel, max. 1 MHz for 5 V TTL or RS 422 differential signals or SSI absolute encoder

6ES7138-6BA00-0BA0

Supported BaseUnits

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

- 1 unit
- 10 units

6ES7193-6BP00-0DA0
6ES7193-6BP00-2DA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- 1 unit
- 10 units

6ES7193-6BP20-0DA0
6ES7193-6BP20-2DA0

BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0

Article No.

Accessories

Reference identification label

10 sheets of 16 labels

6ES7193-6LF30-0AW0

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

6ES7193-6LA10-0AG0

BU cover

For covering empty slots (gaps); 5 units

- 15 mm wide
- 20 mm wide

6ES7133-6CV15-1AM0
6ES7133-6CV20-1AM0

Shield connection

5 shield supports and 5 shield terminals

6ES7193-6SC00-1AM0

Color-coded labels

- Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units
- Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units
- Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units

6ES7193-6CP71-2AA0

6ES7193-6CP72-2AA0

6ES7193-6CP73-2AA0

Overview



- 4 digital inputs, 6 digital outputs
- Inputs for detecting the input edges with μs accuracy
- Outputs for outputting the switching signals with μs accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed mode

Technical specifications

Article number	6ES7138-6CG00-0BA0
	ET 200SP, TM TIMER DIDQ 10X24V
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M 0
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 Update 3
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption, max.	50 mA; without load
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	500 mA; Observe derating
Power losses	
Power loss, typ.	1.5 W
Digital inputs	
Number of digital inputs	4
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes

Article number	6ES7138-6CG00-0BA0
	ET 200SP, TM TIMER DIDQ 10X24V
Digital input functions, parameterizable	
• Digital input with time stamp	Yes
- Number, max.	4
• Counter	Yes
- Number, max.	3
• Counter for incremental encoder	Yes
- Number, max.	1
• Digital input with oversampling	Yes
- Number, max.	4
• HW enable for digital input	Yes
- Number, max.	1
• HW enable for digital output	Yes
- Number, max.	3
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	3 μs for parameterization "none"
for standard inputs	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
- at "0" to "1", min.	4 μs
- at "1" to "0", min.	4 μs
Cable length	
• shielded, max.	1 000 m; Depending on sensor, cable quality and rate of change
• Unshielded, max.	600 m; Depending on sensor, cable quality and rate of change

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Technology modules

Time-based IO module TM Timer DIDQ 10x24V

Technical specifications (continued)

Article number	6ES7138-6CG00-0BA0 ET 200SP, TM TIMER DIDQ 10X24V
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	6
Current-sinking	Yes; With High Speed output
Current-sourcing	Yes
Digital outputs, configurable short-circuit protection	Yes
Limitation of inductive shutdown voltage to	-0.8 V
Digital output functions, parameterizable	
• Digital output with time stamp	Yes
- Number, max.	6
• PWM output	Yes
- Number, max.	6
• Digital output with oversampling	Yes
- Number, max.	6
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
• on lamp load, max.	5 W; 1 W with High Speed output
Load resistance range	
• lower limit	48 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V; With High Speed output
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; 0.1 A with High Speed output, observe derating
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	1 μs; With High Speed output, 5 μs with Standard output
• "1" to "0", max.	1 μs; With High Speed output, 6 μs with Standard output
Switching frequency	
• with resistive load, max.	10 kHz
• on lamp load, max.	10 Hz
Aggregate current of the outputs	
• Current per module, max.	3.5 A; Observe derating
Cable length	
• shielded, max.	1 000 m; Depending on load and cable quality
• Unshielded, max.	600 m; Depending on load and cable quality
Encoder	
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA

Article number	6ES7138-6CG00-0BA0 ET 200SP, TM TIMER DIDQ 10X24V
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	50 kHz
• Counting frequency, max.	200 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Pulse encoder	Yes
Encoder signal 24 V	
- Permissible voltage at input, min.	-30 V
- Permissible voltage at input, max.	30 V
Interface types	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Bus cycle time (TDP), min.	375 μs
Interrupts/diagnostics/status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostics	Yes
• Monitoring the supply voltage	Yes
• Short circuit	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Number of counters	3
Counter frequency (counter) max.	200 kHz; with quadruple evaluation
Counting functions	
• Continuous counting	Yes
Electrical isolation channels	
• between the channels and the backplane bus	Yes
Permissible potential difference	
between different circuits	75 V DC/60 V AC (base isolation)
Isolation	
Isolation checked with	707 V DC (type test)
Ambient conditions	
Ambient temperature in operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C; Observe derating
Decentralized operation	
To SIMATIC S7-1500	Yes
Dimensions	
Width	15 mm
Weights	
Weight, approx.	45 g

Ordering data	Article No.	Accessories	Article No.
TM Timer DIDQ 10x24V time-based IO module		Reference identification label	6ES7193-6LF30-0AW0
4 time-controlled inputs, 6 time-controlled outputs	6ES7138-6CG00-0BA0	10 sheets of 16 labels	
Supported BaseUnits		Labeling strips	
BU15-P16+A0+2D		500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)		500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0
• 1 unit	6ES7193-6BP00-0DA0	1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	6ES7193-6LA10-0AA0
• 10 units	6ES7193-6BP00-2DA0	1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0
BU15-P16+A0+2B		BU cover	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group		For covering empty slots (gaps); 5 units	
• 1 unit	6ES7193-6BP00-0BA0	• 15 mm wide	6ES7133-6CV15-1AM0
• 10 units	6ES7193-6BP00-2BA0	• 20 mm wide	6ES7133-6CV20-1AM0
BU15-P16+A10+2D		Shield connection	6ES7193-6SC00-1AM0
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 inter- nally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)		5 shield supports and 5 shield terminals	
• 1 unit	6ES7193-6BP20-0DA0	Color-coded labels	
• 10 units	6ES7193-6BP20-2DA0	• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	6ES7193-6CP71-2AA0
BU15-P16+A10+2B		• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	6ES7193-6CP72-2AA0
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 inter- nally jumpered AUX terminals (1 A to 10 A); for continuing the load group		• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	6ES7193-6CP73-2AA0
• 1 unit	6ES7193-6BP20-0BA0		
• 10 units	6ES7193-6BP20-2BA0		

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Technology modules

SIWAREX WP321

Overview



SIWAREX WP321 is a versatile and flexible weighing module for the seamless integration of a static scale into the SIMATIC automation environment.

The electronic weighing system is integrated in the SIMATIC ET 200SP series and uses all the features of a modern automation system, such as integrated communication, operator control and monitoring, the diagnostic system and configuration tools in the TIA Portal, SIMATIC Step 7 and WinCC flexible.

Technical specifications

SIWAREX WP321	
Integration in automation systems	<p>SIMATIC S7-300, S7-400, S7-1200 and S7-1500 Via SIMATIC ET 200SP interface module (PROFIBUS or PROFINET)</p> <p>Other manufacturers (with restrictions) Via SIMATIC ET 200SP interface module (PROFIBUS or PROFINET)</p>
Communication interfaces	<ul style="list-style-type: none"> SIMATIC ET 200SP backplane bus RS485 (SIWATOOL, Siebert remote indicator)
Optional remote weight indicator (via RS 485)	Siebert S102
Commissioning options for the scale	<ul style="list-style-type: none"> using SIWATOOL (PC software) using CPU / Touch Panel
Measuring accuracy	<p>according to DIN 1319-1 of full-scale value at 20 °C ± 10 K 0,05 %</p> <p>Internal resolution ± 2 million parts</p>
Number of measurements/second (internal)	100 / 120 Hz
Digital filter	Variable adjustable low-pass and average filter
Typical applications	<ul style="list-style-type: none"> Non-automatic scales Force measurements Fill-level monitoring Belt tension monitors
Weighing functions	
Weight values	<ul style="list-style-type: none"> Gross Net Tare
Limits	<ul style="list-style-type: none"> Min/max Empty
Zeroing function	Via command by controller or HMI
Tare function	Via command by controller or HMI
External tare specification	Via command by controller or HMI
Calibration commands	Via command by controller or HMI
Load cells	Strain gauges in 4-wire or 6-wire system

SIWAREX WP321	
Load cell excitation	<p>Supply voltage (value applies at sensor, cable-related voltage drops of up to 5 V are controlled) 4.85 V DC ±2 %</p> <p>Permissible load resistance</p> <ul style="list-style-type: none"> R_{Lmin} > 40 Ω R_{Lmax} < 4100 Ω <p>With SIWAREX IS Ex interface</p> <ul style="list-style-type: none"> R_{Lmin} > 50 Ω R_{Lmax} < 4100 Ω
Load cell characteristic	1 ... 4 mV/V
Permissible range of measuring signal (at greatest set characteristic value)	-21.3 ... +21.3 mV
Max. distance of load cells	1000 m (459.32 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)
Approvals	<ul style="list-style-type: none"> ATEX Zone 2 (manufacturer declaration) UL available soon FM available soon
Max. cable length	1000 m
Transmission rate	9 600 ... 115 000 bit/s
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	typ. 0.1 A @ 24 V DC (0.2 A max.)
Max. power consumption SIMATIC Bus	30 mA
IP degree of protection to DIN EN 60529; IEC 60529	IP20
Climatic requirements	
T_{min} (IND) ... T_{max} (IND) (operating temperature)	
Vertical installation in SIMATIC S7 ¹⁾	-25 ... +60 °C (-13 ... 140 °F)
Horizontal installation in SIMATIC S7 ¹⁾	-25 ... +60 °C (-13 ... 140 °F)
EMC requirements according to	IEC 61000-6-2, IEC 61000-6-4, OIML-R76-1
Dimensions (width)	15 mm (0.6 in.)

¹⁾ The S7 standard modules may not be operated at temperatures below 0 °C. For operating conditions below 0 °C, SIMATIC modules from the SIPLUS series must be used.

Ordering data	Article No.	Ordering data	Article No.
SIWAREX WP321 Single-channel weighing electronics for scales in SIMATIC ET200SP	7MH4138-6AA00-0BA0	Cable (optional)	
SIWAREX WP321 manual Available in a range of languages Free download from the Internet at: http://www.siemens.com/weighing		Cables Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY, orange sheath	7MH4702-8AG
SIWAREX WP321 "Ready for Use" TIA Portal and SIMATIC Manager sample configuration Free download from the Internet at: http://www.siemens.com/weighing		To connect SIWAREX U, CS, MS, FTA, FTC, M, CF, WP231, WP241 and WP321 to the junction box (JB), extension box (EB) and Ex interface (Ex I) or between two JB's, for fixed laying, occasional bending permitted, approx. 10.8 mm (0.43") outer diameter, for ambient temperature -40 to +80 °C (-104 to +176 °F)	
SIWAREX WP321 configuration package on CD-ROM • "Ready for use" software for operating a scale with SIWAREX WP321 and a touch panel (in many different languages) • SIWATOOL V7.0 calibration tool • Device manuals (PDF files in a variety of languages)	7MH4138-1AK01	Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY, blue sheath	7MH4702-8AF
Accessories (mandatory)		To connect SIWAREX U, CS, MS, FTA, FTC, M, CF, WP231, WP241 and WP321 to the junction box (JB), extension box (EB) and Ex interface (Ex I) or between two JB's, for fixed laying, occasional bending permitted, approx. 10.8 mm (0.43") outer diameter, for ambient temperature -40 to +80 °C (-104 to +176 °F)	
BaseUnit (Type A0 – one BaseUnit required for each WP321) • For opening a new potential group - BU15P-16+A0+2D or - BU15P-16+A10+2D • For continuing the potential group - BU15P-16+A0+2B - BU15P-16+A10+2B	6ES7193-6BP00-0DA0 6ES7193-6BP20-0DA0 6ES7193-6BP00-0BA0 6ES7193-6BP20-0BA0	RS 485/USB interface converter Commercially available interface converter with FTDI chip, e.g. USB-Nano from CTI http://www.cti-shop.com/RS485-Konverter/USB-Nano-485	
Shielded connection for BaseUnit (5 units / for 5 scales) For laying the load cell cable	6ES7193-6SC00-1AM0	Remote display The Siebert S102 and S302 remote digital displays can be directly connected to the SIWAREX FTA via an RS 485 interface. Siebert Industrieelektronik GmbH P.O. Box 1180 65565 Eppelborn Germany Tel.: +49 6806/980-9 Fax: +49 6806/980-999 Internet: http://www.siebert-group.com/en Detailed information is available from the manufacturer.	
Accessories (optional)			
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting several junction boxes	7MH4710-1BA		
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel	7MH4710-1EA		
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate)	7MH4710-1EA01		
Ex interface, type SIWAREX IS With ATEX approval, but without UL and FM approvals , for intrinsically-safe connection of load cells, including device manual Suitable for the SIWAREX U, CS, MS, FTA, FTC, M, CF, WP231 and WP321 weighing modules Approved for use in the EU • Short-circuit current < 199 mA DC • Short-circuit current < 137 mA DC	7MH4710-5BA 7MH4710-5CA		

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Communication

CM PtP serial interface

Overview



- CM PtP communication module; module for serial communication connections with RS 232 and RS 422 interfaces. RS 485 for the Freeport, 3964(R), Modbus RTU, and USS protocols, max. 115.2 kbit/s, 2 KB frame length, 4 KB receive buffer.
- Protocols supported
 - Freeport: User-parameterizable frame format for universal communication
 - 3964(R) for improved transmission reliability
 - Modbus RTU master (requires instructions in SIMATIC S7)
 - Modbus RTU slave (requires instructions in SIMATIC S7)
 - USS, implemented through instructions
- Interface properties
 - RS 232 with auxiliary signals
 - RS 422 for full-duplex connections
 - RS 485 for half-duplex and multi-point connections
 - Transmission rates from 300 to 115200 bit/s
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for errors, operation, and supply voltage
- Communication display for sending and receiving
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the CM module type: silver
 - Hardware and firmware version
 - Complete article number
- Optional labeling accessories
 - Labeling strips
 - Reference identification label
- Optional system-integrated shield connection

9

Technical specifications

Article number	6ES7137-6AA00-0BA0 ET 200SP, CM PTP
Product type designation	
General information	
Product function	
• I&M data	Yes
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V12 / V12
• STEP 7 can be configured/integrated as of version	V5.5 SP2 with GSD file
Installation type/mounting	
Rack mounting possible	Yes
Type of fitting, rail mounting	Yes
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes

Article number	6ES7137-6AA00-0BA0 ET 200SP, CM PTP
Input current	
Current consumption (rated value)	29 mA
Power losses	
Power loss, typ.	0.7 W
Interfaces	
1st interface	
Interface types	
- RS 232	Yes
- RS 422	Yes
- RS 485	Yes
RS 232	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	15 m
• RS-232 accompanying signals	RTS, CTS, DTR, DSR, RI, DCD
RS 485	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 200 m
RS 422	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 200 m
• 4-wire full duplex connection	Yes
• 4-wire multipoint connection	Yes

Technical specifications (continued)

Article number	6ES7137-6AA00-0BA0 ET 200SP, CM PTP
Integrated protocols	
Freeport	
- Telegram length, max.	2 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
3964 (R)	
- Telegram length, max.	2 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
Modbus RTU master	
- Address area	1 to 247, extended 1 to 65535
- Number of slaves, max.	32
MODBUS RTU slave	
- Address area	1 to 247, extended 1 to 65535
Frame buffer	
• Buffer memory for message frames	4 kbyte
• Number of message frames which can be buffered	255
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostic messages	
• Diagnostics	Yes
• Wire break	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
• Receive RxD	Yes; Green LED
• Send TxD	Yes; Green LED
Galvanic isolation	
between the backplane bus and interface	Yes
Permissible potential difference	
between different circuits	75 V DC/60 V AC (base isolation)
Isolation	
Isolation checked with	707 V DC (type test)
Decentralized operation	
To SIMATIC S7-300	Yes
To SIMATIC S7-400	Yes
To SIMATIC S7-1200	No
To SIMATIC S7-1500	Yes
To standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Weights	
Weight, approx.	30 g

Ordering data

Article No.

CM PtP communication module	6ES7137-6AA00-0BA0
for serial communication connections with RS 232, RS 422, RS 485 interfaces, BU type A0, color code CC00	
Accessories	
BU15-P16+A0+2D	6ES7193-6BP00-0DA0
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+2B	6ES7193-6BP00-0BA0
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
BU15-P16+A10+2D	6ES7193-6BP20-0DA0
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
BU15-P16+A10+2B	6ES7193-6BP20-0BA0
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
Reference identification label	6ES7193-6LF30-0AW0
10 sheets of 16 labels	
Labeling strips	6ES7193-6LR10-0AA0
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	
Shield connection	6ES7193-6SC00-1AM0
5 shield supports and 5 shield terminals, for direct connection	

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Communication

CM IO-Link

Overview



- CM IO-Link communication module
Serial communication module for connecting up to 4 IO-Link devices in accordance with IO-Link specification V1.0 and V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.0 and higher.
- Supported data transfer rates
 - COM1 (4.8 kbit/s)
 - COM2 (38.4 kbit/s)
 - COM3 (230.4 kbit/s)
- Expansion limits
 - Length of cable: Max. 20 m
 - Max. 32 bytes of input and output data per port
 - Max. 32 bytes of input and output data per module
- Supported ET 200SP system functions
 - Replacement without PG with automatic backup without the engineering tool of the IO-Link device parameters (V1.1 devices only) and the IO-Link master parameters by means of redundant saving of parameters to e-coding element
 - Reparameterization during operation
 - Identification data I&M
 - Firmware update
 - PROFlenergy
- Can be plugged into type A0 BaseUnits (BU) with automatic e-coding
- LED indicators
 - DIAG: Operating state indicator (green/red) of the module
 - C1..C4: Port status indicator (green) for Port 1, 2, 3 and 4
 - Q1..Q4: Channel status indicator (green) for Port 1, 2, 3 and 4
 - F1..F4: Port fault indicator (red) for Port 1, 2, 3 and 4
 - PWR: Supply voltage indicator (green)
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color-coding of the module class CM: silver
 - Hardware and firmware version
 - Complete article number
- Optional accessories
 - Labeling strips
 - Reference identification label
 - Color-coding plate with color code CC04
- Optional system-integrated shield connection

Overview of CM 4xIO-Link

Analog output	Article number	CC code	BU type	PU
CM 4xIO-Link	6ES7137-6BD00-0BA0	CC04	A0	1

Overview (continued)

Overview of BaseUnits

BaseUnit	Article number	CC codes for process terminals	CC codes for AUX terminals	PU
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10

Technical specifications

Article number	6ES7137-6BD00-0BA0 ET 200SP, CM 4 X IO-LINK ST
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Power losses	
Power loss, typ.	1 W
Isochronous mode	
equidistance	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes; The port diagnosis is available in the IO-Link mode only.
Diagnostic messages	
• Diagnostics	Yes
• Monitoring the supply voltage	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; one green LED for channel status Qn (SIO mode) and port status Cn (IO-Link mode) per channel
• for channel diagnostics	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED

Article number	6ES7137-6BD00-0BA0 ET 200SP, CM 4 X IO-LINK ST
Galvanic isolation	
Electrical isolation channels	
• between the channels	No
• between the channels and the backplane bus	Yes
Permissible potential difference	
between different circuits	75 V DC/60 V AC (base isolation)
Isolation	
Isolation checked with	707 V DC (type test)
Dimensions	
Width	15 mm
Weights	
Weight, approx.	30 g

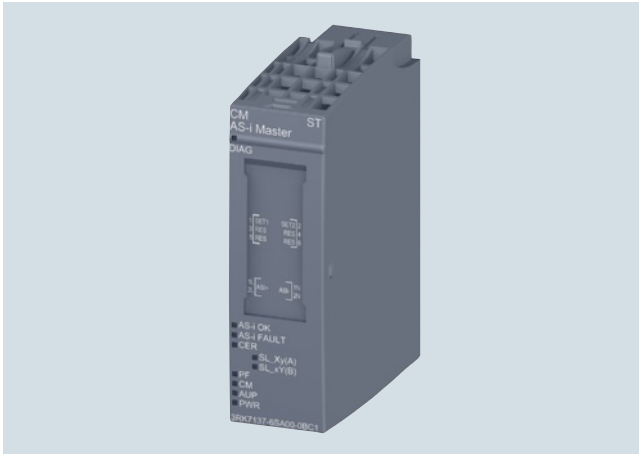
I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Communication

CM IO-Link

Ordering data	Article No.	Reference identification label	Article No.
CM IO-Link Master V1.1 Standard communication module Serial communication module for connecting up to 4 IO-Link devices, time-based IO, BU type A0, color code CC04	6ES7137-6BD00-0BA0	Reference identification label 10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit	6ES7193-6LF30-0AW0
Accessories		Labeling strips	
Supported type A0 BaseUnits		500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0
BU15-P16+A10+2D		500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)		1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer	6ES7193-6LA10-0AA0
<ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	1000 labeling strips DIN A4, yellow, cardboard, preperforated, for inscription with laser printer	6ES7193-6LA10-0AG0
BU15-P16+A0+2D		Color-coding plates	
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)		Color code CC04, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), blue (terminals 13 to 16); 10 units	6ES7193-6CP04-2MA0
<ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	Color code CC71, for 10 AUX terminals, BU type A0, yellow-green (terminals 1 A to 10 A); 10 units	6ES7193-6CP71-2AA0
BU15-P16+A10+2B		Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	6ES7193-6CP72-2AA0
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group		Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	6ES7193-6CP73-2AA0
<ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0		
BU15-P16+A0+2B			
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group			
<ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0		

Overview



CM AS-i Master ST for SIMATIC ET 200SP

The CM AS-i Master ST communication module is designed for use in the SIMATIC ET 200SP distributed I/O system and has the following features:

- As many as 62 AS-Interface slaves can be connected
- Supports all AS-Interface master functions according to the AS-Interface Specification V3.0
- User-friendly configuration with graphic display of the AS-i line in TIA Portal V12.0 or in other systems by using GSD
- Supply via AS-Interface cable
- Suitable for AS-i Power24V and for AS-Interface with 30 V voltage
- Integrated ground-fault monitoring for the AS-Interface cable
- Through connection to AS-Interface and in combination with ET 200SP, the number of digital inputs and outputs available for the control system is greatly increased (max. 496 DI/496 DO on the AS-Interface per CM AS-i Master ST).
- Integrated analog value processing

Basic unit: ET 200SP Distributed I/O System

SIMATIC ET 200SP is a scalable and highly flexible distributed I/O system for connecting the process signals to a central control system via PROFIBUS or PROFINET.

Up to eight CM AS-i Master STs can be plugged into a SIMATIC ET 200SP with the IM 155-6 PN standard interface module.

For more information, see "SIMATIC ET 200SP Distributed I/O system" System Manual
<http://support.automation.siemens.com/WW/view/en/58649293>

Design

The CM AS-i Master ST module has an ET 200SP module enclosure with a width of 20 mm. A C0 type BaseUnit (BU) is required for use in the ET 200SP.

The module has LED indicators for diagnostics, operation, AS-i voltage and AS-i slave status and offers informative front-side module inscription for

- Plain-text marking of the module type and function class
- 2D matrix code (article number and serial number)
- Connection diagram
- Color coding of the CM module type: light gray
- Hardware and firmware version
- Complete article number

Function

The CM AS-i Master ST supports all specified functions of the AS-Interface Specification V3.0.

The input/output values of the digital AS-i slaves can be activated via the cyclic process image. The values of the analog AS-i slaves can be attained via the cyclic process image (firmware V1.1 or higher) or via data record transfer.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM AS-i Master ST in STEP 7.

Expansions from firmware version V1.1

In order to implement modular machine concepts, the AS-i Slaves can be activated or deactivated via the PLC program (option handling). The configuration of AS-i slaves can be modified while being executed, thus enabling variable machine set-ups.

An existing AS-i installation can be read into the STEP 7 hardware configuration and then adapted and documented in the project. Analog values are transmitted via the cyclic process image, the length of which is adjustable and extendable up to 288 Bytes (depending on the interface module (IM) used).

Diagnostic information is accessed in the program by means of data record reading, process image, alarm messages or in STEP 7 in a graphical overview matrix. The new functions are available with the TIA Portal STEP 7 V13 SP1 or with STEP 7 V5.5 with HSP 2092 V3.01). Configuration is possible with SIMATIC CPUs S7-300 up to S7-1500 and with a SINUMERIK or other controller.

Safety note

The use of this product requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation; see
<http://www.siemens.com/industrialsecurity>.

¹⁾ HSP 2092 see
<https://support.industry.siemens.com/cs/ww/en/view/23183356>.

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Communication

CM AS-i Master ST for SIMATIC ET 200SP

Overview (continued)

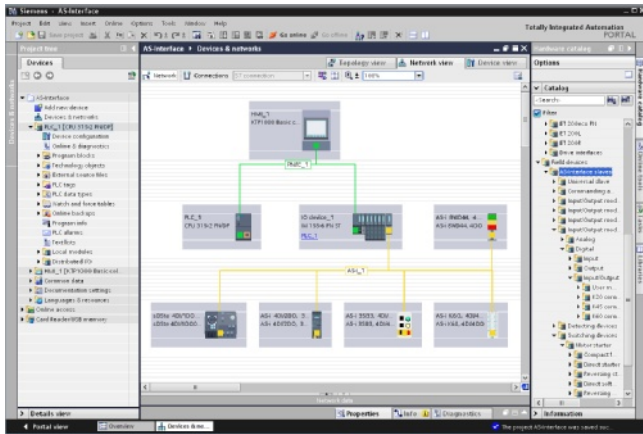
Configuration

The following software is required for configuration of the CM AS-i Master ST module:

- STEP 7 (classic) V5.5 SP3 HF4 or higher with HSP 2092 or HSP 2092 V3.0 (for firmware V1.1) or
- STEP 7 (TIA Portal) V12 or higher or V13 SP1 or higher (for firmware V1.1) or
- the GSD file of the ET 200SP with STEP 7 or another engineering tool

STEP 7 enables user-friendly configuration and diagnostics of the AS-i master and any connected slaves.

Alternatively, you can also apply the AS-Interface ACTUAL configuration as the DESIRED configuration at the "touch of a button" via the control panel integrated in the TIA Portal or an optional expansion button. Configuration with the GSD file is possible only with the button.



Configuration of an AS-Interface network with CM AS-i Master ST via TIA Portal

The CM AS-i Master ST module occupies up to 288 input bytes and up to 288 output bytes in the I/O data of the ET 200SP station. The I/O assignment depends on the configuration in STEP 7.

Ordering data

Article No.

CM AS-i Master ST communication module

3RK7137-6SA00-0BC1

- AS-Interface master for SIMATIC ET 200SP, can be plugged onto BaseUnit type C0
- Corresponds to AS-Interface Specification V3.0
- Dimensions (W x H x D / mm): 20 x 73 x 58

Accessories

BaseUnit BU20-P6+A2+4D

6ES7193-6BP20-0DC0

- BaseUnit (light), BU type C0
- Suitable for the CM AS-i Master ST module
- For connection of AS-Interface cable to the CM AS-i Master ST
- Beginning of an AS-i network, disconnection of AS-i voltage to the left-hand module

PROFINET interface module IM 155-6 PN Standard

Max. 32 I/O modules,
Max. 256 bytes I/O data per station

6ES7155-6AA00-0BNO

- Including server module and bus adapter 2 x RJ45 (delivered without RJ45 plug)
- Including server module (bus adapter must be ordered separately, see below)

6ES7155-6AU00-0BNO

PROFINET interface module IM 155-6 PN High Feature

Max. 64 I/O modules,
Max. 1440 bytes I/O data per station

6ES7155-6AU00-0CNO

- Including server module (bus adapter must be ordered separately, see below)

PROFIBUS interface module IM 155-6 DP High Feature

Max. 32 I/O modules,
Max. 244 bytes I/O data per station

6ES7155-6BA00-0CNO

- Including server module and PROFIBUS connector

Bus adapters for PROFINET

For connection of the Ethernet cable to the PROFINET IM 155-6 PN interface module

- Connection 2 x RJ45 (supplied without RJ45 connector)
- Connection 2 x FC (FastConnect)

6ES7193-6AR00-0AA0

6ES7193-6AF00-0AA0

Overview



- PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbit/s
- Expands the ET 200SP CPUs 1510SP-1 PN / 1512SP-1 PN by one PROFIBUS connection
- For communication with lower-level PROFIBUS devices at bandwidths of 9.6 kbit/s to 12 Mbit/s
- Communication services:
 - PROFIBUS DP
 - PG/OP communication
 - S7 communication:
 - This makes it possible to establish communication between the ET 200SP CPU and other devices, for example those from the SIMATIC S7-300/400/1500 range.
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Data set routing

Technical specifications

Article number	6ES7545-5DA00-0AB0 ET 200SP, CM DP FOR ET 200SP CPU
Product type designation	
Engineering with	V13 Update 3
• STEP 7 TIA Portal can be configured/integrated as of version	
Installation type/mounting	
Rack mounting possible	No
Type of fitting, rail mounting	Yes; Standard - DIN rail
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Interfaces	
1st interface	
Interface types	
- RS 485	Yes
Protocols	
- SIMATIC communication	Yes
- PROFIBUS DP master	Yes
- PROFIBUS DP slave	Yes
RS 485	
• Transmission rate, max.	12 Mbit/s
• Cable length, max.	100 m
Protocols	
PROFIBUS DP master	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Data record routing	Yes
- Isochronous mode	No
- equidistance	No
- Number of DP slaves	125
- Activation/deactivation of DP slaves	Yes

Article number	6ES7545-5DA00-0AB0 ET 200SP, CM DP FOR ET 200SP CPU
PROFIBUS DP slave	
• Transmission rate, max.	12 Mbit/s
• Automatic baud rate search	Yes
• Address area, max.	120
• User data per address area, max.	128 byte
Services	
- PG/OP communication	Yes; Only with active interface
- Routing	Yes; Only with active interface
- S7 communication	Yes; Only with active interface
- Direct data exchange (slave-to-slave communication)	Yes; No subscriber possible - only passive publisher
- DPV1	Yes
Transfer memory	
- Inputs	244 byte
- Outputs	244 byte
Diagnostic messages	
• Diagnostics	Yes
Diagnostics indication LED	
• for module diagnostics	Yes; green/red DIAG LED
Galvanic isolation	
between the backplane bus and interface	Yes
Ambient conditions	
Ambient temperature in operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Dimensions	
Width	35 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	80 g

I/O systems

ET 200 systems for the control cabinet
 ET 200SP - I/O modules - Communication

CM DP for ET 200SP CPU**Ordering data****Article No.****Article No.****CM DP for ET 200SP CPU**

PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbit/s

6ES7545-5DA00-0AB0**Accessories****Reference identification label**

10 sheets of 16 labels

6ES7193-6LF30-0AW0**Labeling strips**

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

6ES7193-6LA10-0AG0**PROFIBUS DP bus connector RS 485**

With 90° cable outlet, max. transfer rate 12 Mbit/s

- without PG interface
- with PG interface

6ES7972-0BA12-0XA0**6ES7972-0BB12-0XA0**

With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbit/s

- without PG interface, 1 unit
- without PG interface, 100 units
- with PG interface, 1 unit
- with PG interface, 100 units

6ES7972-0BA52-0XA0**6ES7972-0BA52-0XB0****6ES7972-0BB52-0XA0****6ES7972-0BB52-0XB0****FastConnect bus cable****6XV1830-0EH10**

Standard type with special design for quick mounting, 2-core, shielded, sold by the meter; max. delivery unit 1000 m, minimum ordering quantity 20 m

Overview



- Low-cost Access Point, suitable for applications where the device is to be mounted in the control cabinet

Product versions**SCALANCE W761-1 RJ45**

- A wireless card permanently installed in the device

Technical specifications

Article number	6GK5761-1FC00-0AA0 6GK5761-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W761-1 RJ45
Transmission rate	
Transfer rate	
• with WLAN maximum	150 Mbit/s
• 1 for Industrial Ethernet	10 Mbit/s
• 2 for Industrial Ethernet	100 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
Interfaces	
Number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole screw terminal
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
Interfaces wireless	
Number of radio cards permanently installed	1
Number of electrical connections for external antenna(s)	1
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes

Article number	6GK5761-1FC00-0AA0 6GK5761-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W761-1 RJ45
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Consumed current	
• for DC at 24 V typical	0.15 A
Active power loss	
• for DC at 24 V typical	3.6 W
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP20

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Communication

SCALANCE W761 RJ45 for use in the control cabinet

Technical specifications (continued)

Article number	6GK5761-1FC00-0AA0 6GK5761-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W761-1 RJ45
Design, dimensions and weight	
Width	50 mm
Height	114 mm
Depth	74 mm
Width of the enclosure without antenna	50 mm
Height of the enclosure without antenna	114 mm
Depth of the enclosure without antenna	74 mm
Net weight	0.13 kg
Mounting type	
• S7-300 rail mounting	No
• S7-1500 rail mounting	No
• wall mounting	No
Wireless frequencies	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
Product properties, functions, components general	
Product function Access Point Mode	Yes
Product function Client Mode	Yes
Number of SSIDs	1
Product function	
• Dual Client	No
• iPCF Access Point	No
• iPCF client	No
• iPCF-MC Access Point	No
• iPCF-MC client	No
Product functions management, configuration	
Number of manageable IP addresses in client	4
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via e-mail	Yes
• Configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• forced roaming with IWLAN	No
• WDS	Yes
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher-level designation/location designation	Yes

Article number	6GK5761-1FC00-0AA0 6GK5761-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W761-1 RJ45
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	Yes
• Link Check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
Product functions VLAN	
Product function	
• function VLAN with IWLAN	Yes
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
Product functions Redundancy	
Protocol is supported	
• STP/RSTP	Yes
Product functions Security	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes

Technical specifications (continued)

Article number	6GK5761-1FC00-0AA0 6GK5761-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W761-1 RJ45
Standards, specifications, approvals	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
• for hazardous zone from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, CL. 1, Div. 2, GP. A,B,C,D, T4 / CL. 1, Zone 2, GP IIC
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• CCC	No
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Fire protection in accordance with EN 45545-2	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• Det Norske Veritas (DNV)	No
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
Accessories	
accessories	24 V DC screw terminal included in scope of delivery

¹⁾ Wireless approval in the USA

Ordering data

Article No.

SCALANCE W761 Access Points

IWLAN Access Point with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbit/s; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of delivery: mounting hardware, 3-pin screw terminal for 24V DC; manual on CD-ROM; German/English

SCALANCE W761-1 RJ45

IWLAN Access Point with one built-in wireless interface

- National approvals for operation outside the USA
- National approvals for operation within the USA ¹⁾

6GK5761-1FC00-0AA0**6GK5761-1FC00-0AB0****Accessories****IE FC RJ45 Plug 180 2 x 2**

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0**6GK1901-1BB10-2AB0****6GK1901-1BB10-2AE0****IE FC Standard Cable GP 2 x 2****6XV1840-2AH10**

4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m

IE FC stripping tool**6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

Antennas and miscellaneous IWLAN accessories

See Industrial Wireless LAN/ accessories, Catalog IK PI

¹⁾ Please note national approvals under <http://www.siemens.com/wireless-approvals>

I/O systems

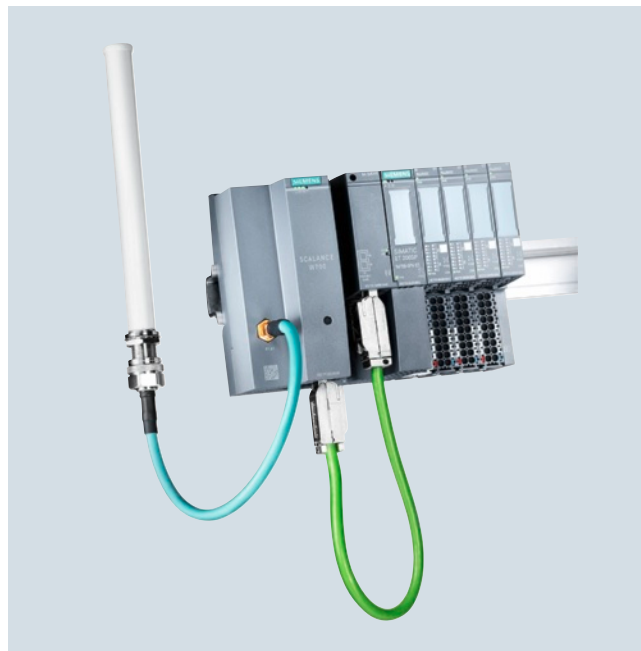
ET 200 systems for the control cabinet
ET 200SP - I/O modules - Communication

SCALANCE W722 RJ45 for use in the control cabinet

Overview



- Low-cost Client Module, suitable for applications where the device is to be mounted in the control cabinet
- Equipped with iFeatures



ET 200SP station with SCALANCE W722 RJ45

Product versions

SCALANCE W722-1 RJ45

- A wireless card permanently installed in the device; suitable for establishing wireless connections with iFeatures

9

Technical specifications

Article number	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W722-1 RJ45
Transmission rate	
Transfer rate	
• with WLAN maximum	150 Mbit/s
• 1 for Industrial Ethernet	10 Mbit/s
• 2 for Industrial Ethernet	100 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
Interfaces	
Number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole screw terminal
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
Interfaces wireless	
Number of radio cards permanently installed	1
Number of electrical connections for external antenna(s)	1
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes

Article number	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W722-1 RJ45
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Consumed current	
• for DC at 24 V typical	0.15 A
Active power loss	
• for DC at 24 V typical	3.6 W
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP20

Technical specifications (continued)

Article number	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W722-1 RJ45
Design, dimensions and weight	
Width	50 mm
Height	114 mm
Depth	74 mm
Width of the enclosure without antenna	50 mm
Height of the enclosure without antenna	114 mm
Depth of the enclosure without antenna	74 mm
Net weight	0.13 kg
Mounting type	
• S7-300 rail mounting	No
• S7-1500 rail mounting	No
• wall mounting	No
Wireless frequencies	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
Product properties, functions, components general	
Product function Access Point Mode	No
Product function Client Mode	Yes
Product function	
• Dual Client	No
• iPCF client	Yes
• iPCF-MC Access Point	No
• iPCF-MC client	Yes
Number of iPCF-capable radio modules	1
Product functions management, configuration	
Number of manageable IP addresses in client	4
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via e-mail	Yes
• Configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• forced roaming with IWLAN	No
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	No
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/location designation	Yes

Article number	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W722-1 RJ45
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	Yes
• Link Check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
Product functions VLAN	
Product function	
• function VLAN with IWLAN	No
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
Product functions Security	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Communication

SCALANCE W722 RJ45 for use in the control cabinet

Technical specifications (continued)

Article number	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W722-1 RJ45
Standards, specifications, approvals	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
• for hazardous zone from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, CL. 1, Div. 2, GP. A,B,C,D, T4 / CL. 1, Zone 2, GP IIC
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• CCC	No
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Fire protection in accordance with EN 45545-2	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• Det Norske Veritas (DNV)	No
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
Accessories	
accessories	24 V DC screw terminal included in scope of delivery

¹⁾ Wireless approval in the USA

Ordering data

Article No.

SCALANCE W722 Client Modules

IWLAN Ethernet Client Modules with iFeatures support and built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbit/s; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of delivery: mounting hardware, 3-pin screw terminal for 24V DC; manual on CD-ROM; German/English

SCALANCE W722-1 RJ45

For administration of the wireless connection with iFeatures from a connected device with Industrial Ethernet connection

- National approvals for operation outside the USA
- National approvals for operation within the USA¹⁾

6GK5722-1FC00-0AA0

6GK5722-1FC00-0AB0

Accessories

IE FC RJ45 Plug 180 2 x 2

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

IE FC Standard Cable GP 2 x 2

6XV1840-2AH10

4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval
Sold by the meter
max. quantity 1000 m
minimum order 20 m

IE FC Stripping Tool

6GK1901-1GA00

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

Antennas and miscellaneous IWLAN accessories

See Industrial Wireless LAN/ accessories

¹⁾ Please note national approvals under <http://www.siemens.com/wireless-approvals>

Overview



- Low-cost Client Module, suitable for applications where the device is to be mounted in the control cabinet

SCALANCE W721-1 RJ45

- A wireless card permanently installed in the device

Technical specifications

Article number	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W721-1 RJ45
Transmission rate	
Transfer rate	
• with WLAN maximum	150 Mbit/s
• 1 for Industrial Ethernet	10 Mbit/s
• 2 for Industrial Ethernet	100 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
Interfaces	
Number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole screw terminal
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
Interfaces wireless	
Number of radio cards permanently installed	1
Number of electrical connections for external antenna(s)	1
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Consumed current	
• for DC at 24 V typical	0.15 A
Active power loss	
• for DC at 24 V typical	3.6 W

Article number	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W721-1 RJ45
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP20
Design, dimensions and weight	
Width	50 mm
Height	114 mm
Depth	74 mm
Width of the enclosure without antenna	50 mm
Height of the enclosure without antenna	114 mm
Depth of the enclosure without antenna	74 mm
Net weight	0.13 kg
Mounting type	
• S7-300 rail mounting	No
• S7-1500 rail mounting	No
• wall mounting	No
Wireless frequencies	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
Product properties, functions, components general	
Product function Access Point Mode	No
Product function Client Mode	Yes
Product function	
• Dual Client	No
• iPCF client	No
• iPCF-MC client	No

I/O systems

ET 200 systems for the control cabinet
ET 200SP - I/O modules - Communication

SCALANCE W721 RJ45 for use in the control cabinet

Technical specifications (continued)

Article number	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0 ¹⁾	Article number	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W721-1 RJ45	Product type designation	SCALANCE W721-1 RJ45
Product functions management, configuration		Product functions Time	
Number of manageable IP addresses in client	4	Protocol is supported	
Product function		• SNTP	Yes
• CLI	Yes	• SIMATIC Time	Yes
• web-based management	Yes	Standards, specifications, approvals	
• MIB support	Yes	Standard	
• TRAPs via e-mail	Yes	• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• Configuration with STEP 7	Yes	• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• configuration with STEP 7 in the TIA Portal	Yes	• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
• forced roaming with IWLAN	No	• for hazardous zone from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, CL. 1, Div. 2, GP. A,B,C,D, T4 / CL. 1, Zone 2, GP IIC
• WDS	No	Certificate of suitability	
Protocol is supported		• EC declaration of conformity	Yes
• Address Resolution Protocol (ARP)	Yes	• CE marking	Yes
• ICMP	Yes	• C-Tick	Yes
• Telnet	Yes	• CCC	No
• HTTP	Yes	• E1 approval	No
• HTTPS	Yes	• Railway application in accordance with EN 50155	No
• TFTP	Yes	• Fire protection in accordance with EN 45545-2	No
• DCP	Yes	• NEMA TS2	No
• LLDP	No	• IEC 61375	No
Identification & maintenance function		• IEC 61850-3	No
• I&MO - device-specific information	Yes	• NEMA4X	No
• I&M1 – higher-level designation/location designation	Yes	• Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af	No
Product functions Diagnosis		• Power-over-Ethernet according to IEEE802.3at for type 2	No
Product function		Standard for wireless communication	
• PROFINET IO diagnosis	Yes	• IEEE 802.11a	Yes
• Link Check	No	• IEEE 802.11b	Yes
• connection monitoring IP-Alive	No	• IEEE 802.11e	Yes
• localization via Aeroscout	No	• IEEE 802.11g	Yes
• SysLog	Yes	• IEEE 802.11h	Yes
Protocol is supported		• IEEE 802.11i	Yes
• SNMP v1	Yes	• IEEE 802.11n	Yes
• SNMP v2	Yes	Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
• SNMP v3	Yes	Marine classification association	
Product functions VLAN		• American Bureau of Shipping Europe Ltd. (ABS)	No
Product function		• Bureau Veritas (BV)	No
• function VLAN with IWLAN	No	• Det Norske Veritas (DNV)	No
Product functions DHCP		• Germanische Lloyd (GL)	No
Product function		• Lloyds Register of Shipping (LRS)	No
• DHCP client	Yes	• Nippon Kaiji Kyokai (NK)	No
• in Client Mode DHCP server via LAN	No	• Polski Rejestr Statkow (PRS)	No
Product functions Security		Accessories	
Product function		accessories	24 V DC screw terminal included in scope of delivery
• ACL - MAC-based	No		
• Management security, ACL-IP based	Yes		
• IEEE 802.1x (radius)	Yes		
• NAT/NAPT	No		
• access protection according to IEEE802.11i	Yes		
• WPA/WPA2	Yes		
• TKIP/AES	Yes		
Protocol is supported			
• SSH	Yes		

¹⁾ Wireless approval in the USA

Ordering data	Article No.	Ordering data	Article No.
SCALANCE W721 Client Modules IWLAN Ethernet Client Modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbit/s; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of delivery: mounting hardware, 3-pin screw terminal for 24V DC; manual on CD-ROM; German/English		Accessories IE FC RJ45 Plug 180 2 x 2 RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface <ul style="list-style-type: none"> • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units 	
SCALANCE W721-1 RJ45 For administration of the wireless connection from a connected device with Industrial Ethernet connection <ul style="list-style-type: none"> • National approvals for operation outside the USA • National approvals for operation within the USA¹⁾ 	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0	IE FC Standard Cable GP 2 x 2 4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0 6XV1840-2AH10
		IE FC Stripping Tool Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	6GK1901-1GA00
		Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/ accessories

¹⁾ Please note national approvals under <http://www.siemens.com/wireless-approvals>

I/O systems

ET 200 systems for the control cabinet
ET 200SP - Fail-safe I/O modules

Digital F input modules

Overview

Digital fail-safe input module:

F-DI 8x24 V DC High Feature for BU type A0, color code CC01

Important features:

- 8-channel digital fail-safe input module for the ET 200SP
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 8 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type DI: white
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete article number
- Optional labeling accessories
 - Labeling strips
 - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations. They can be used with all fail-safe SIMATIC S7 CPUs.

Technical specifications

Article number	6ES7136-6BA00-0CA0 ET 200SP, EL-MOD., F-DI 8X24VDC HF
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V12
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
• PROFINET as of GSD version/GSD revision	V2.31
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	8
short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)
Output current	
• up to 60 °C, max.	0.3 A
24 V encoder supply	
• 24 V	Yes; min. L+ (-1.5 V)
• short-circuit protection	Yes
• Output current, max.	800 mA

Article number	6ES7136-6BA00-0CA0 ET 200SP, EL-MOD., F-DI 8X24VDC HF
Digital inputs	
Number of digital inputs	8
m/p-reading	Yes; p-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+15 to +30V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- Parameterizable	Yes
for counter/technological functions	
- Parameterizable	No
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	500 m
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED

Technical specifications (continued)

Article number	6ES7136-6BA00-0CA0 ET 200SP, EL-MOD., F-DI 8X24VDC HF
Galvanic isolation	
Electrical isolation channels	
• between the channels and the backplane bus	Yes
Isolation	
Isolation checked with	707 V DC (type test)
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to EN ISO 13849-1:2008	PLe
• SIL according to IEC 61508	SIL 3
• Low demand mode: PFDavg	< 2.00E-05 1/h
• High demand/continuous mode: PFH	< 1.00E-09 1/h
Ambient conditions	
Ambient temperature in operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Dimensions	
Width	15 mm
Weights	
Weight, approx.	49 g

Ordering data

Article No.

Digital F input modulesF-DI 8x24 V DC High Feature,
BU type A0, color code CC01**6ES7136-6BA00-0CA0****Supported BaseUnits****BU15-P16+A0+2D**BU type A0; BaseUnit (light) with
16 process terminals to the module;
for starting a new load group
(max. 10 A)

- 1 unit
- 10 units

6ES7193-6BP00-0DA0
6ES7193-6BP00-2DA0**BU15-P16+A0+2B**BU type A0; BaseUnit (dark) with
16 process terminals to the module;
for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0**BU15-P16+A10+2D**BU type A0; BaseUnit (light) with
16 process terminals (1...16) to the
module and an additional 10 inter-
nally jumpered AUX terminals
(1 A to 10 A); for starting a new load
group (max. 10 A)

- 1 unit
- 10 units

6ES7193-6BP20-0DA0
6ES7193-6BP20-2DA0**BU15-P16+A10+2B**BU type A0; BaseUnit (dark) with
16 process terminals (1...16) to the
module and an additional 10 inter-
nally jumpered AUX terminals
(1 A to 10 A); for continuing the load
group

- 1 unit
- 10 units

6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0

I/O systems

ET 200 systems for the control cabinet

ET 200SP - Fail-safe I/O modules

Digital F input modules

Ordering data	Article No.	Article No.
Accessories		
S7 Distributed Safety programming tool V5.4 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher Floating license for 1 user Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery	6ES7833-1FC02-0YA5 6ES7833-1FC02-0YH5	Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer 500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer 1000 labeling strips DIN A4, light gray, card, for inscription with laser printer 1000 labeling strips DIN A4, yellow, card, for inscription with laser printer
STEP 7 Safety Advanced V13 SP1 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1 Floating license for 1 user Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery	6ES7833-1FA13-0YA5 6ES7833-1FA13-0YH5	BU cover For covering empty slots (gaps); 5 units <ul style="list-style-type: none"> • 15 mm wide • 20 mm wide
Reference identification label 10 sheets of 16 labels	6ES7193-6LF30-0AW0	Shield connection 5 shield supports and 5 shield terminals Color-coding plates <ul style="list-style-type: none"> • Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units • Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units • Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units • Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units
		E-coding element type F 5 units, spare part

¹⁾ For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

Overview

Digital fail-safe output module:
F-DQ 4x24 V DC High Feature, BU type A0, color code CC01

Important features:

- 4-channel digital fail-safe output module for the ET 200SP
- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type DI: white
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete article number
- Optional labeling accessories
 - Labeling strips
 - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFI-safe, both in PROFIBUS, and in PROFINET configurations.
- They can be used with all fail-safe SIMATIC S7 CPUs.

Technical specifications

Article number	6ES7136-6DB00-0CA0 ET 200SP, EL-MOD., F-DQ 4XDC 24V/2A
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V12
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
• PROFINET as of GSD version/GSD revision	V2.31
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Digital outputs	
Number of digital outputs	4
Digital outputs, configurable	Yes
short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	typ. 2*47V
Switching capacity of the outputs	
• with resistive load, max.	2 A
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	2 000 Ω
Output voltage	
• Type of output voltage	DC
• for signal *1*, min.	24 V; L+ (-0.5 V)
Output current	
• for signal *1* rated value	2 A
• for signal *0* residual current, max.	0.5 mA

Article number	6ES7136-6DB00-0CA0 ET 200SP, EL-MOD., F-DQ 4XDC 24V/2A
Switching frequency	
• with resistive load, max.	30 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; according to IEC 947-5-1, DC-13, symmetrical
• on lamp load, max.	10 Hz; Symmetrical
Aggregate current of the outputs	
• Current per channel, max.	2 A; Note derating data in the manual
• Current per module, max.	6 A; Note derating data in the manual
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	500 m
Interrupts/diagnostics/status information	
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED

I/O systems

ET 200 systems for the control cabinet
ET 200SP - Fail-safe I/O modules

Digital F output modules

Technical specifications (continued)

Article number	6ES7136-6DB00-0CA0 ET 200SP, EL-MOD., F-DQ 4XDC 24V/2A
Galvanic isolation	
Electrical isolation channels	
• between the channels and the backplane bus	Yes
Isolation	
Isolation checked with	707 V DC (type test)
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to EN ISO 13849-1:2008	PLe
• SIL according to IEC 61508	SIL 3
• Low demand mode: PFDavg	< 2.00E-05 1/h
• High demand/continuous mode: PFH	< 1.00E-09 1/h
Ambient conditions	
Ambient temperature in operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Dimensions	
Width	15 mm
Weights	
Weight, approx.	57 g

Ordering data

Digital F output modules
F-DQ 4x24 V DC High Feature,
BU type A0, color code CC01

Article No.

6ES7136-6DB00-0CA0

Supported BaseUnits

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

- 1 unit
- 10 units

6ES7193-6BP00-0DA0
6ES7193-6BP00-2DA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- 1 unit
- 10 units

6ES7193-6BP20-0DA0
6ES7193-6BP20-2DA0

BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0

BU20-P12+A4+0B

BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group

6ES7193-6BP20-0BB0

Ordering data	Article No.	Article No.
Accessories		
S7 Distributed Safety programming tool V5.4 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher Floating license for 1 user Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery	6ES7833-1FC02-0YA5 6ES7833-1FC02-0YH5	Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer 6ES7193-6LR10-0AA0 500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer 6ES7193-6LR10-0AG0 1000 labeling strips DIN A4, light gray, card, for inscription with laser printer 6ES7193-6LA10-0AA0 1000 labeling strips DIN A4, yellow, card, for inscription with laser printer 6ES7193-6LA10-0AG0
STEP 7 Safety Advanced V13 SP1 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1 Floating license for 1 user Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery	6ES7833-1FA13-0YA5 6ES7833-1FA13-0YH5	BU cover For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide 6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0
Reference identification label 10 sheets of 16 labels	6ES7193-6LF30-0AW0	Shield connection 5 shield supports and 5 shield terminals 6ES7193-6SC00-1AM0
		Color-coding plates • Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units 6ES7193-6CP02-2MA0 • Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units 6ES7193-6CP71-2AA0 • Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units 6ES7193-6CP72-2AA0 • Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units 6ES7193-6CP73-2AA0
		E-coding element type F 5 units, spare part 6ES7193-6EF00-1AA0

¹⁾ For up-to-date information and download availability, see:
<http://www.siemens.com/tia-online-software-delivery>

I/O systems

ET 200 systems for the control cabinet

ET 200SP - Fail-safe I/O modules

Digital F output module relay

Overview

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

- 1 relay output (2 NO contacts)
- Total output current 5 A
- Rated load voltage 24 V DC and 24...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 (IEC 61508) when the control of the F-RQ module is implemented via a fail-safe output (e.g. ET 200SP 4F-DQ 24 V DC/2 A PROFIsafe).

Technical specifications

Article number	6ES7136-6RA00-0BF0 ET 200SP, F-RQ 1X24VDC/24...230VAC/5A ST
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V13
• STEP 7 can be configured/integrated as of version	V5.5 SP4 and higher
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V; Coil voltage
Digital outputs	
Number of digital outputs	1
Limitation of inductive shutdown voltage to	No
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	5 A
• on lamp load, max.	25 W
Switching frequency	
• with resistive load, max.	2 Hz
• with inductive load, max.	0.1 Hz; See data in manual
• with inductive load (to IEC 60947-5-1, DC13), max.	0.1 Hz
• with inductive load (to IEC 60947-5-1, AC15), max.	2 Hz
Total current of the outputs (per module)	
horizontal installation	
- up to 40 °C, max.	5 A; Note derating data in the manual
- up to 50 °C, max.	4 A; Note derating data in the manual
- up to 60 °C, max.	3 A; Note derating data in the manual
vertical installation	
- up to 50 °C, max.	3 A; Note derating data in the manual

Article number	6ES7136-6RA00-0BF0 ET 200SP, F-RQ 1X24VDC/24...230VAC/5A ST
Relay outputs	
• Number of relay outputs	1; 2 NO contacts
• Rated input voltage of relay coil L+ (DC)	24 V
• Current consumption of relays (coil current of all relays), max.	70 mA
• external protection for relay outputs	yes; 6 A, see data in manual
• Relay approved acc. to UL 508	Yes; Pilot Duty B300, R300
Switching capacity of contacts	
- with inductive load, max.	see additional description in the manual
- with resistive load, max.	see additional description in the manual
- Thermal continuous current, max.	5 A
- Switching current, min.	1 mA
- Switching current after exceeding 300 mA, min.	10 mA
- Switching current after exceeding 300 mA, max.	5 A
- rated switching voltage (DC)	24 V
- rated switching voltage (AC)	230 V
Cable length	
• shielded, max.	500 m; for load contacts
• Unshielded, max.	300 m; for load contacts
• Control cable (input), max.	10 m
Diagnostic messages	
• Diagnostics	yes, firmware update
Diagnostics indication LED	
• RUN LED	Yes; green/red DIAG LED
• Channel status display	Yes; Green LED
Galvanic isolation	
Electrical isolation channels	
• between the channels and the backplane bus	Yes
Isolation	
Isolation checked with	2545V DC 2s (routine test)
Overvoltage category	III
tested with	
• between channels and backplane bus/supply voltage	DC 2545 V 2 s (routine test), impulse voltage test DC 7200 V / 5 positive and 5 negative pulses (type test)
• between backplane bus and supply voltage	707 V DC (type test)

Digital F output module relay

Article number	6ES7136-6RA00-0BF0 ET 200SP, F-RQ 1X24VDC/24...230VAC/5A ST
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
<ul style="list-style-type: none"> Performance level according to EN ISO 13849-1:2008 Category acc. to ISO 13849-1:2008 SIL according to IEC 61508 Low demand (PFD) acc. to SIL2 Low demand mode: PFDavg High demand (PFH) acc. to SIL2 High demand/continuous mode: PFH 	PL e 4 SIL 3 < 1.00E-04, function test 1x per year < 1.00E-05, function test 1x per month < 1.00E-08 1/h, function test 1x per year < 6.00E-09 1/h, function test 1x per month

Article number	6ES7136-6RA00-0BF0 ET 200SP, F-RQ 1X24VDC/24...230VAC/5A ST
Dimensions	
Width	20 mm
Weights	
Weight, approx.	56 g

Ordering data

	Article No.
Digital F output module relay 1 F-RQ BU type F0, relay output (2 NO contacts), total output current 5 A, load voltages 24 V DC and 24...230 V AC; can be used up to SIL 3 / Category 4/ PL e if controlled via F-DQ	6ES7136-6RA00-0BF0
Supported BaseUnits	
BU20-P8+A4+0B BU type F0; BaseUnit (dark) with 8 process terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group	6ES7193-6BP20-0BF0
Accessories	
S7 Distributed Safety programming tool V5.4 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher Floating license for 1 user Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery	6ES7833-1FC02-0YA5 6ES7833-1FC02-0YH5

	Article No.
STEP 7 Safety Advanced V13 SP1 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1 Floating license for 1 user Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery	6ES7833-1FA13-0YA5 6ES7833-1FA13-0YH5
Reference identification label 10 sheets of 16 labels	6ES7193-6LF30-0AW0
Labeling strips 500 labeling strips on roll, light gray 500 labeling strips on roll, yellow 1000 labeling strips DIN A4, light gray 1000 labeling strips DIN A4, yellow	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0
BU cover For covering empty slots (gaps); 5 units • 20 mm wide	6ES7133-6CV15-1AM0
Shield connection 5 shield supports and 5 shield terminals	6ES7193-6SC00-1AM0
Color-coded labels • Color code CC42, module-specific; for BaseUnit type F0; 10 units	6ES7193-6CP42-2MB0

¹⁾ For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

I/O systems

ET 200 systems for the control cabinet

ET 200SP - Fail-safe I/O modules

Fail-safe special modules

Overview

Digital fail-safe power module:
F-PM-E PPM 24 V DC/8 A for BU type C0, color code CC52

Important features:

- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Safety-related shutdown of output modules within the potential group of the F-PM-E
- Two fail-safe digital inputs, for reading of sensor information (1 or 2 channels)
- One fail-safe digital output onboard (ppm switching, up to 2 A, up to SIL 3/PL e)
- Fail-safe digital output and potential supply pp or pm switching can be parameterized
- Parameterizable onboard evaluation of the fail-safe inputs for control of the fail-safe digital outputs and of the potential group
- Digital standard output modules can be shut down up to PL d (ISO 13849) and SIL 2 (IEC 61508) (up to 8 A).
- Can be plugged into type C0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type DI: white
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete article number
- Optional labeling accessories
 - Labeling strips
 - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. They can be used with all fail-safe SIMATIC S7 CPUs.

Technical specifications

Article number	6ES7136-6PA00-0BC0 ET 200SP, POWERMOD. F-PM-E PPM, DC24V
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V12
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V2.3
• PROFINET as of GSD version/GSD revision	V2.31
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Input voltage	
• Type of input voltage	DC
Output voltage	
Type of output voltage	DC
Encoder supply	
Number of outputs	2
short-circuit protection	Yes; Electronic (response threshold 0.7 A to 2.1 A)
Output current	
• up to 60 °C, max.	0.3 A
24 V encoder supply	
• 24 V	Yes; min. L+ (-1.5 V)
• short-circuit protection	Yes
• Output current, max.	600 mA
Digital inputs	
Number of digital inputs	2
m/p-reading	Yes; p-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+15 to +30V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- Parameterizable	Yes
for counter/technological functions	
- Parameterizable	No
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	500 m

Technical specifications (continued)

Article number	6ES7136-6PA00-0BC0 ET 200SP, POWERMOD. F-PM-E PPM, DC24V
Digital outputs	
Number of digital outputs	1
Digital outputs, configurable	Yes
short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	max. 1.5 V
Switching capacity of the outputs	
• with resistive load, max.	8 A
• on lamp load, max.	100 W
Load resistance range	
• lower limit	3 Ω
• upper limit	2 000 Ω
Output voltage	
• for signal "1", min.	24 V; L+ (-0.5 V)
Output current	
• for signal "1" rated value	8 A
• for signal "0" residual current, max.	1.5 mA; PP-switching: max. 1.5 mA; PM-switching: max. 1 mA
Switching frequency	
• with resistive load, max.	10 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; according to IEC 947-5-1, DC-13, symmetrical
• on lamp load, max.	4 Hz; Symmetrical
Aggregate current of the outputs	
• Current per channel, max.	8 A; Note derating data in the manual
• Current per module, max.	8 A; Note derating data in the manual
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	500 m

Article number	6ES7136-6PA00-0BC0 ET 200SP, POWERMOD. F-PM-E PPM, DC24V
Interrupts/diagnostics/ status information	
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED
Galvanic isolation	
Electrical isolation channels	
• between the channels and the backplane bus	Yes
Isolation	
Isolation checked with	707 V DC (type test)
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to EN ISO 13849-1:2008	PLe
• SIL according to IEC 61508	SIL 3
• Low demand mode: PFDavg	< 2.00E-05 1/h
• High demand/continuous mode: PFH	< 1.00E-09 1/h
Dimensions	
Width	20 mm
Height	72 mm
Depth	55 mm
Weights	
Weight, approx.	70 g

Ordering data

**F-PM-E 24 V DC/8 A PPM
Standard digital F power module**
BU type C0, color code CC52.
2 inputs, 1 output, SIL 3/Cat. 4/PL e

Article No.
6ES7136-6PA00-0BC0

Type C0 BaseUnits

BU20-P6+A2+4D
BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new load group

Article No.
6ES7193-6BP20-0DC0

Accessories

Reference identification label **6ES7193-6LF30-0AW0**
10 sheets of 16 labels

Labeling strips **6ES7193-6LA10-0AG0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

BU cover **6ES7133-6CV20-1AM0**
For covering empty slots (gaps); 5 units
• 20 mm wide

Shield connection **6ES7193-6SC00-1AM0**
5 shield supports and 5 shield terminals

Color-coding plates **6ES7193-6CP52-2MC0**
• Color code CC52, module-specific, for 8 push-in terminals; 10 units

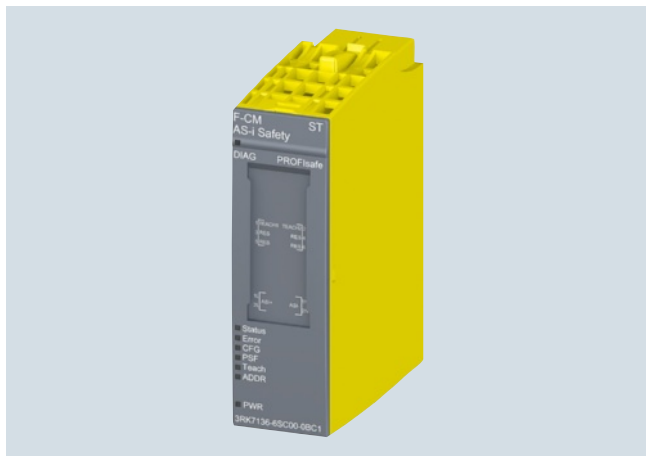
E-coding element type F **6ES7193-6EF00-1AA0**
5 units, spare part

I/O systems

ET 200 systems for the control cabinet
ET 200SP - Fail-safe I/O modules - Communication

F-CM AS-i Safety ST for ET 200SP

Overview



F-CM AS-i Safety ST for SIMATIC ET 200SP

The FCM AS-i Safety ST fail-safe communication module supplements an AS-Interface network without additional wiring to produce a safety-related AS-i network.

Important features:

- Fail-safe communication module for the ET 200SP
 - 31 fail-safe input channels in the process image
 - 16 fail-safe output channels in the process image
 - Certified up to SIL 3 (IEC 62061/IEC 61508), PL e (EN ISO 13849-1)
 - Parameterization conforms with other fail-safe I/O modules of the ET 200SP
- The communication module supports PROFIsafe in PROFINET and PROFIBUS configurations. Can be used with fail-safe SIMATIC S7-300F/S7-416F CPUs and S7-1500F CPUs (TIA Portal V13 SP1 and higher with HSP 0070 V2.0).
- For reading up to 31 fail-safe AS-i input slaves
 - 2 sensor inputs/signals for each fail-safe AS-i input slave
 - Adjustable evaluation of sensor signals: 2-channel or 2 x 1-channel
 - Integrated discrepancy evaluation in the case of 2-channel signals
 - Integrated AND operation in the case of 2 x 1-channel signals
 - Input delay can be parameterized
 - Start-up test can be set
 - Sequence monitoring can be activated
- For control of up to 16 fail-safe AS-i output circuit groups
 - The output circuit groups are controlled independently of one another.
 - One output circuit group can act on one or more actuators (e.g. to switch drives simultaneously).
 - An actuator (e.g. a contactor) is interfaced via a fail-safe AS-i output module (e.g. safe SlimLine module S45F, Article No. 3RK1405-1SE15-0AA2; see [Catalog IC 10, Chapter 2 "Industrial communication"](#) → "ASIsafe" → "Fail-safe AS-Interface modules").
 - Simple fault acknowledgment via the process image
- Simple module replacement thanks to automatic importing of the safety parameters from the coding element

- Comprehensive diagnostic options
- Can be plugged onto type C1 or type C0 BaseUnits (BU)
- Supply via AS-Interface voltage
- 8 LED indicators for diagnostics, operating state, fault indication and supply voltage
- Informative front-side module inscription
 - Plain-text marking of the module type and function class
 - 2D matrix code (article number and serial number)
 - Connection diagram
 - Color coding of the CM module type: light gray
 - Hardware and firmware version
 - Complete article number
- Optional labeling accessories
 - Labeling strips
 - Reference identification label

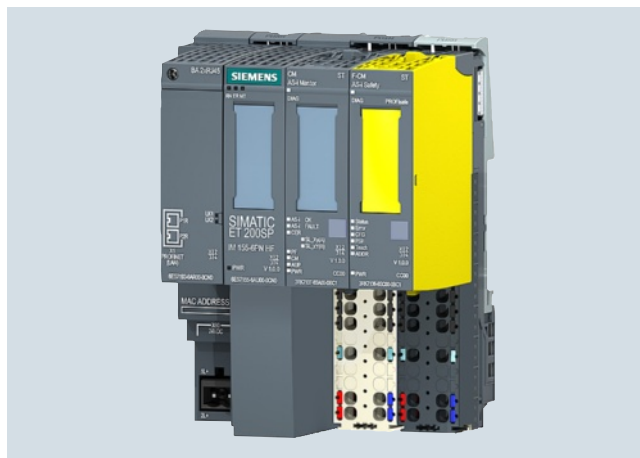
Design

The fail-safe F-CM AS-i Safety ST master has an ET 200SP module enclosure with a width of 20 mm.

One AS-i master according to the AS-i Specification V3.0 and fail-safe AS-i input slaves and/or fail-safe AS-i output modules are needed for operation. The CM AS-i Master ST communication module (Article No. 3RK7137-6SA00-0BC1; see [page 9/73](#)) is recommended as the AS-i master for the ET 200SP.

SIMATIC AS-i F-Link

The simple combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules in one ET 200SP station results in a powerful PROFIBUS or PROFINET/AS-i F-Link that can be expanded further on a modular basis.



SIMATIC AS-i F-Link: combination of an ET 200SP interface module, CM AS-i Master ST and F-CM AS-i Safety ST

With the digital and analog I/O modules of the ET 200SP, local inputs and outputs can be realized in the SIMATIC AS-i F-Link so as to ensure that the F-Link complies precisely with customer requirements. Expansion variants for almost every application are possible thanks to the selection of standard and fail-safe I/O modules.

Besides the single AS-i master, double, triple or generally multiple masters can be realized with or without fail-safe functionality.

Overview (continued)Supported BaseUnits

With the recommended combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules, the CM module is plugged onto a light type C0 BaseUnit and, directly on the right of it, the F-CM module is plugged onto a dark type C1 BaseUnit. The AS-i cable is connected only on the light BaseUnit of the CM module.

If the F-CM AS-i Safety ST module is not combined with the CM AS-i Master ST module, but another AS-i master is used instead, then the F-CM module is plugged onto a light type C0 BaseUnit. In this case, the AS-i cable is connected on the light BaseUnit of the F-CM module.

Safety note

The use of this product requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation; see <http://www.siemens.com/industrialsecurity>.

Configuration

The following software is required for configuration of the F-CM AS-i Safety ST module:

- STEP 7 (classic), V5.5 SP3 HF4 or higher with HSP 2093¹⁾ and Distributed Safety V5.4 SP5 or F-Configuration Pack SP11

or

- STEP 7 (TIA Portal) V13 or higher with HSP 0070²⁾ and Safety Advanced V13.

For connection to S7-1500F you require STEP 7 V13 SP1.

When configuring with STEP 7 V13 SP1, the new version of the HSP 0070 V2.0 (or higher) is required.

Configuration and programming are done entirely in the STEP 7 user interface. No additional configuration software is needed for commissioning.

Data management – together with all other configuration data of the SIMATIC – is realized completely in the S7 project.

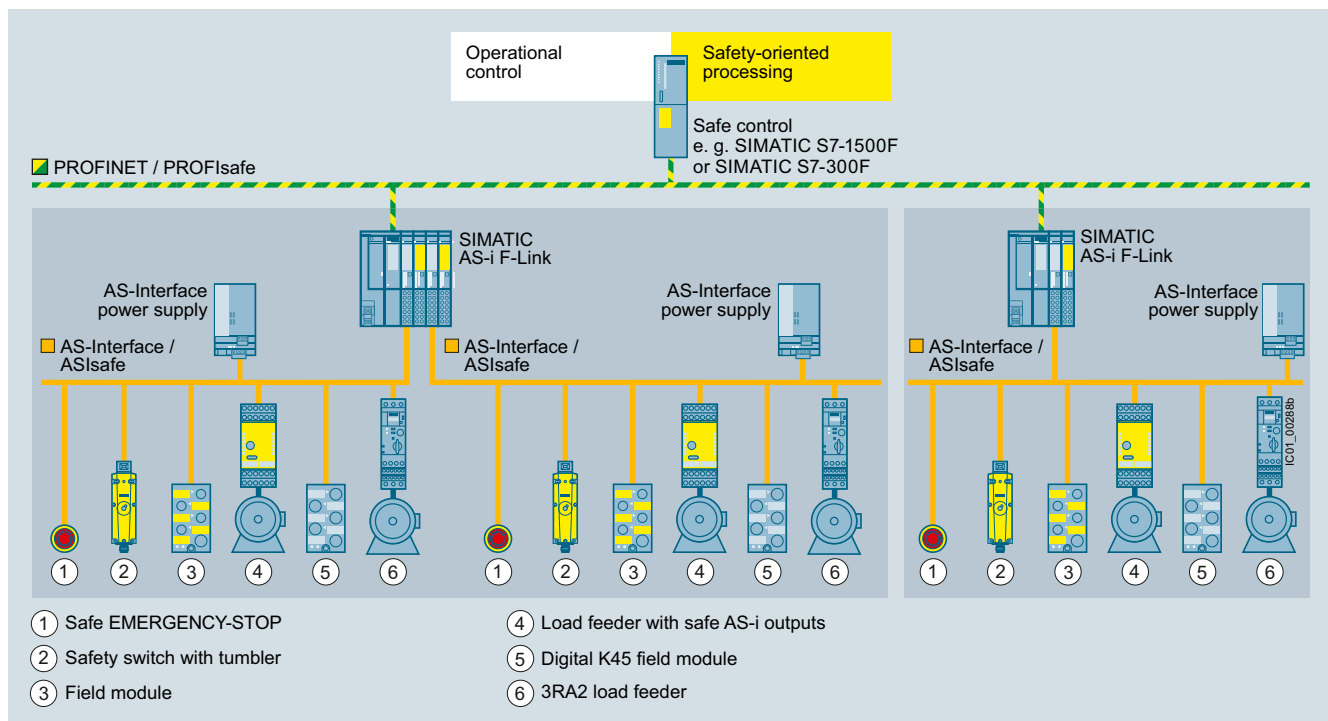
The input and output channels are assigned to the process image automatically and manual linking via configuration function blocks is not necessary.

If the F-CM AS-i Safety ST module is replaced, all necessary settings are automatically imported into the new module.

The F-CM AS-i Safety ST module occupies 16 input bytes and 8 output bytes in the I/O data of the ET 200SP station.

¹⁾ HSP 2093 see <https://support.industry.siemens.com/cs/ww/en/view/23183356>.

²⁾ HSP 0070 see <https://support.industry.siemens.com/cs/ww/en/view/72341852>.



AS-Interface configuration with SIMATIC AS-i F-Link, consisting of an ET 200SP station with CM AS-i Master ST and F-CM AS-i Safety ST modules

I/O systems

ET 200 systems for the control cabinet
ET 200SP - Fail-safe I/O modules - Communication

F-CM AS-i Safety ST for ET 200SP

Ordering data	Article No.		Article No.
<p>F-CM AS-i Safety ST communication modules</p> <ul style="list-style-type: none"> • Fail-safe module for SIMATIC ET 200SP, can be plugged onto BaseUnit type C1 (alternatively type C0) • Operation requires an AS-i master, e.g. CM AS-i Master ST (see page 9/74). • Can be used up to SIL 3 (IEC 62061/IEC 61508), PL e (EN ISO 13849-1) • Coding element type F (included in scope of supply) • Dimensions (W × H × D / mm): 20 × 73 × 58 	<p>3RK7136-6SC00-0BC1</p>	<p>Accessories</p> <p>BaseUnit BU20-P6+A2+4B</p> <ul style="list-style-type: none"> • BaseUnit (dark), BU type C1 • Suitable for the F-CM AS-i Safety ST fail-safe module • Continuation of an AS-i network, connection with the AS-i voltage of the left-hand module <p>Coding element type F (spare part)</p> <ul style="list-style-type: none"> • For ET 200SP modules F-CM AS-i Safety ST, F-DI, F-DQ, F-PM-E • Packing unit 5 items <p>More accessories</p>	<p>6ES7193-6BP20-0BC1</p> <p>6ES7193-6EF00-1AA0</p> <p>See page 9/74</p>

Overview



With the BaseUnits, the ET 200SP offers a rugged and service-friendly design with permanent wiring:

- No tools needed for one-handed wiring using push-in terminals
- Outstanding access due to arrangement of measuring tap, spring NC contacts and cable entry in columns, while at the same time reducing the space required by 64%
- Fault-proof color coding of the spring NC contacts for better orientation in the terminal panel
- Replacement of I/O modules during operation without affecting the wiring
- Operation with module gaps (missing I/O module)
- Automatic coding of the I/O modules prevents destruction of the electronics if a module is accidentally inserted in the wrong slot during replacement
- High immunity to electromagnetic interference due to
 - self-assembling shielded backplane bus,
 - multi-layer conductor plate with shield levels for interference-free signal transmission from the terminal to the I/O module,
 - system-integrated, space-saving shield connection for quick installation.
- Self-assembling potential groups without external wiring or jumpers
- Replaceable terminal box
- Side-by-side latching of the BUs for high mechanical load capacity
- Optional module-specific color identification of the terminals according to the color code CC
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm

Technical specifications

Article number	6ES7193-6BP00-0BA0	6ES7193-6BP00-0BA1	6ES7193-6BP00-0BD0	6ES7193-6BP00-0DA0	6ES7193-6BP00-0DA1
	BASEUNIT TYPE A0, BU15-P16+A0+2B	BASEUNIT TYPE A1, BU15-P16+A0+2B/T	BASEUNIT TYPE D0, BU20-P12+A0+0B	BASEUNIT TYPE A0, BU15-P16+A0+2D	BASEUNIT TYPE A1, BU15-P16+A0+2D/T
Product type designation					
Dimensions					
Width	15 mm	15 mm	20 mm	15 mm	15 mm
Height	117 mm	117 mm	117 mm	117 mm	117 mm
Weights					
Weight, approx.	40 g	40 g	47 g	40 g	40 g
Article number	6ES7193-6BP40-0BA1		6ES7193-6BP40-0DA1		
	BASEUNIT TYPE A1, BU15-P16+A0+12B/T		BASEUNIT TYPE A1, BU15-P16+A0+12D/T		
Product type designation					
Dimensions					
Width	15 mm		15 mm		
Height	141 mm		141 mm		
Weights					
Weight, approx.	50 g		50 g		
Article number	6ES7193-6BP20-0BA0	6ES7193-6BP20-0BB0	6ES7193-6BP20-0DA0	6ES7193-6BP20-0DC0	
	BASEUNIT TYPE A0, BU15-P16+A10+2B	BASEUNIT TYP B0, BU20-P12+A4+0B	BASEUNIT TYPE A0, BU15-P16+A10+2D	BASEUNIT TYP C0, BU20-P6+A2+4D	
Product type designation					
Dimensions					
Width	15 mm	20 mm	15 mm	20 mm	
Height	141 mm	117 mm	141 mm	117 mm	
Weights					
Weight, approx.	50 g	48 g	50 g	47 g	

I/O systems

ET 200 systems for the control cabinet
ET 200SP

BaseUnits

Ordering data	Article No.	Ordering data	Article No.
Type A0 BaseUnits		Type C0 BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A) • 1 unit • 10 units	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	BU20-P6+A2+4D BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new load group	6ES7193-6BP20-0DC0
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A) • 1 unit • 10 units	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	Type D0 BaseUnits	
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group • 1 unit • 10 units	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0	BU20-P12+A0+0B BU type D0; BaseUnit (dark) with 12 push-in terminals, without AUX terminals, bridged to the left	6ES7193-6BP00-0BD0
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group • 1 unit • 10 units	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0	Type A1 BaseUnits (with temperature detection)	
Type B0 BaseUnits		BU15-P16+A0+12D/T BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and additionally 2x5 internally jumpered add-on terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	6ES7193-6BP40-0DA1
BU20-P12+A4+0B BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group	6ES7193-6BP20-0BB0	BU15-P16+A0+2D/T BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	6ES7193-6BP00-0DA1
Type B1 BaseUnits		BU15-P16+A0+12B/T BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered add-on terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	6ES7193-6BP40-0BA1
BU20-P12+A0+4B BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; 1 unit	6ES7193-6BP20-0BB1	BU15-P16+A0+2B/T BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6ES7193-6BP00-0BA1
		Type F0 BaseUnits	
		BU20-P8+A4+0B BU type F0; BaseUnit (dark) with 8 process terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group	6ES7193-6BP20-0BF0

Ordering data	Article No.	Article No.
Accessories		
Reference identification label 10 sheets of 16 labels	6ES7193-6LF30-0AW0	6ES7193-6CP01-2MA0
BU cover for covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0	6ES7193-6CP02-2MA0 6ES7193-6CP03-2MA0 6ES7193-6CP04-2MA0
Shield connection 5 shield supports and 5 shield terminals	6ES7193-6SC00-1AM0	6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0 6ES7193-6CP74-2AA0 6ES7193-6CP81-2AB0 6ES7193-6CP82-2AB0 6ES7193-6CP83-2AB0 6ES7193-6CP41-2MB0 6ES7193-6CP84-2AC0 6ES7193-6CP85-2AC0 6ES7193-6CP86-2AC0
		Color-coded labels <ul style="list-style-type: none"> • Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units • Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units • Color code CC03, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units • Color code CC04, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units • Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units • Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units • Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units • Color code CC74, for 2x5 additional terminals, 5 x red, 5 x blue, for BU type A1, with push-in terminals; 10 units • Color code CC81, for 4 AUX terminals 1 A to 4 A, yellow/green, for BaseUnit type B0; 10 units • Color code CC82, for 4 AUX terminals 1 A to 4 A, red, for BaseUnit type B0; 10 units • Color code CC83, for 4 AUX terminals 1 A to 4 A, blue, for BaseUnit type B0; 10 units • Color code CC41, module-specific, for 12 push-in terminals; for BaseUnit type B1; 10 units • Color code CC84, for 2 AUX terminals 1 A to 2 A, yellow/green, for BaseUnit type C0; 10 units • Color code CC85, for 2 AUX terminals 1 A to 2 A, red, for BaseUnit type C0; 10 units • Color code CC86, for 2 AUX terminals 1 A to 2 A, blue, for BaseUnit type C0; 10 units

I/O systems

ET 200 systems for the control cabinet
ET 200SP

SIPLUS BaseUnits

Overview



With the BaseUnits, the ET 200SP offers a rugged and service-friendly design with permanent wiring:

- No tools needed for one-handed wiring using push-in terminals
- Outstanding access due to arrangement of measuring tap, spring NC contacts and cable entry in columns, while at the same time reducing the space required by 64%
- Fault-proof color coding of the spring NC contacts for better orientation in the terminal panel
- Replacement of I/O modules during operation without affecting the wiring
- Operation with module gaps (missing I/O module)
- Automatic coding of the I/O modules prevents destruction of the electronics if a module is accidentally inserted in the wrong slot during replacement
- High immunity to electromagnetic interference due to
 - self-assembling shielded backplane bus,
 - multi-layer conductor plate with shield levels for interference-free signal transmission from the terminal to the I/O module,
 - system-integrated, space-saving shield connection for quick installation.
- Self-assembling potential groups without external wiring or jumpers
- Replaceable terminal box
- Side-by-side latching of the BUs for high mechanical load capacity
- Optional module-specific color identification of the terminals according to the color code CC
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm

Note:

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

Technical specifications

Article number	6AG1193-6BP00-7BA0	6AG1193-6BP00-7DA0	6AG1193-6BP20-7BA0	6AG1193-6BP20-7DA0
Based on	6ES7193-6BP00-0BA0 SIPLUS ET200SP BU15-P16+A0+2B	6ES7193-6BP00-70A0 SIPLUS ET200SP BU15-P16+A0+2D	6ES7193-6BP20-0BA0 SIPLUS ET200SP BU15-P16+A10+2B	6ES7193-6BP20-0DA0 SIPLUS ET200SP BU15-P16+A10+2D
Extended ambient conditions				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Technical specifications (continued)

Article number	6AG1193-6BP00-7BA0	6AG1193-6BP00-7DA0	6AG1193-6BP20-7BA0	6AG1193-6BP20-7DA0
Based on	6ES7193-6BP00-0BA0 SIPLUS ET200SP BU15-P16+A0+2B	6ES7193-6BP00-70A0 SIPLUS ET200SP BU15-P16+A0+2D	6ES7193-6BP20-0BA0 SIPLUS ET200SP BU15-P16+A10+2B	6ES7193-6BP20-0DA0 SIPLUS ET200SP BU15-P16+A10+2D
Resistance				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
Article number	6AG1193-6BP00-7BA1	6AG1193-6BP00-7DA1	6AG1193-6BP40-7BA1	6AG1193-6BP40-7DA1
Based on	6ES7193-6BP00-0BA1 SIPLUS ET200SP BU15-P16+A0+2B/T	6ES7193-6BP00-0DA1 SIPLUS ET200SP BU15-P16+A0+2D/T	6ES7193-6BP40-0BA1 SIPLUS ET200SP BU15-P16+A0+12B/T	6ES7193-6BP40-0DA1 SIPLUS ET200SP BU15-P16+A0+12D/T
Extended ambient conditions				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

I/O systems

ET 200 systems for the control cabinet

ET 200SP

SIPLUS BaseUnits

Ordering data	Article No.	Ordering data	Article No.
SIPLUS BaseUnits type A0		SIPLUS BaseUnits type A1 (with temperature detection)	
BU15-P16+A0+2D (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA0	BU15-P16+A0+2D/T (Extended temperature range and medial exposure) BU type A1; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA1
BU15-P16+A0+2B (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0	BU15-P16+A0+2B/T (Extended temperature range and medial exposure) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6AG1193-6BP00-7BA1
BU15-P16+A10+2D (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1A to 10A); for starting a new load group (max. 10 A)	6AG1193-6BP20-7DA0	BU15-P16+A0+12D/T (Extended temperature range and medial exposure) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered AUX terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	6AG1193-6BP40-7DA1
BU15-P16+A10+2B (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1A to 10A); for continuing the load group	6AG1193-6BP20-7BA0	BU15-P16+A0+12B/T (Extended temperature range and medial exposure) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered AUX terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	6AG1193-6BP40-7BA1
		Accessories	See SIMATIC ET 200SP BaseUnits, page 9/101

Overview



BusAdapter BA 2xRJ45



BusAdapter BA 2xFC

Some interface modules of the SIMATIC ET 200SP have a universal PROFINET interface for BusAdapters. With the appropriate bus adapter, the type of connection can be adapted to the requirements of the respective application:

- For standard applications with a moderate mechanical and EMC load, the BusAdapter BA 2xRJ45 is used. It offers two sockets for standard RJ45 plugs.
- For machines and systems in which higher mechanical and/or EMC loads act on the devices, the BusAdapter BA 2xFC is recommended. In this case, the bus cables are connected directly by means of FastConnect terminals – similar to the PROFIBUS connector, proven in millions of applications. The technology is extremely quick to assemble and achieves 5 times better vibration resistance and also 5 times greater resistance to electromagnetic interference, when compared to RJ45 plug-in connectors.
- BusAdapters with connections for fiber-optic cables can be used to cover high potential differences between two stations and/or high EMC loads.

Another advantage of the BusAdapters: In order to repair defective RJ45 sockets or for subsequent conversion to the rugged FastConnect technology or a fiber-optic connection, only the adapter needs to be replaced.

The following interface modules offer a PROFINET connection via BusAdapter:

- IM 155-6PN Standard
- IM 155-6PN High Feature

Ordering data

Ordering data	Article No.	Ordering data	Article No.
BusAdapter BA 2xRJ45 For IM 155-6PN ST, HF	6ES7193-6AR00-0AA0	BusAdapter BA SCRJ/RJ45 For IM 155-6PN HF; with media converter FOC-copper; 1 x SCRJ FO connection, 1 x RJ45 connection	6ES7193-6AP20-0AA0
BusAdapter BA 2xFC For IM 155-6PN ST, HF; for increased vibration and EMC loads	6ES7193-6AF00-0AA0	BusAdapter BA SCRJ/FC For IM 155-6PN HF; with media converter FOC-copper; 1 x SCRJ FO connection, 1 x FastConnect connection	6ES7193-6AP40-0AA0
BusAdapter BA 2xSCRJ For IM 155-6PN HF, fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	6ES7193-6AP00-0AA0	Reference identification label 10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit	6ES7193-6LF30-0AW0

I/O systems

ET 200 systems for the control cabinet
ET 200SP

Accessories

Overview

Labeling strips

- Labeling strips for ET 200SP
- Can be used for the interface module, bus adapter, I/O module and BU cover

Reference identification labels



- For the labeling of ET 200SP components with a reference code (equipment identifier)
- Can be used for the interface module, I/O module, bus adapter and BU cover

BU covers

- Protective cover for empty slots of an ET 200SP
- For protecting the plug-in connectors of a BaseUnit without I/O module

Color-coded labels

- For module-specific identification of the potentials at the terminals of the BaseUnit
- For the prevention of wiring faults

Shield connection

- Simple, quick-mounting shield connection
- For space-saving and optimized connection of cable shields from EMC viewpoint

Ordering data

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

6ES7193-6LA10-0AG0

Reference identification label

6ES7193-6LF30-0AW0

10 sheets of 16 labels

Ordering data

Article No.

BU cover

For covering empty slots (gaps); 5 units

- 15 mm wide
- 20 mm wide

6ES7133-6CV15-1AM0

6ES7133-6CV20-1AM0

Color-coded labels

- Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units

6ES7193-6CP01-2MA0

- Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units

6ES7193-6CP02-2MA0

- Color code CC03, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units

6ES7193-6CP03-2MA0

- Color code CC04, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units

6ES7193-6CP04-2MA0

- Color code CC05, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units

6ES7193-6CP05-2MA0

- Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units

6ES7193-6CP71-2AA0

- Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units

6ES7193-6CP72-2AA0

- Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units

6ES7193-6CP73-2AA0

- Color code CC74, for 2x5 additional terminals, 5 x red, 5 x blue, for BU type A1, with push-in terminals; 10 units

6ES7193-6CP74-2AA0

- Color code CC81, for 4 AUX terminals 1 A to 4 A, yellow/green, for BaseUnit type B0; 10 units

6ES7193-6CP81-2AB0

- Color code CC82, for 4 AUX terminals 1 A to 4 A, red, for BaseUnit type B0; 10 units

6ES7193-6CP82-2AB0

- Color code CC83, for 4 AUX terminals 1 A to 4 A, blue, for BaseUnit type B0; 10 units

6ES7193-6CP83-2AB0

- Color code CC41, module-specific, for 12 push-in terminals; for BaseUnit type B1; 10 units

6ES7193-6CP41-2MB0

- Color code CC84, for 2 AUX terminals 1 A to 2 A, yellow/green, for BaseUnit type C0; 10 units

6ES7193-6CP84-2AC0

- Color code CC85, for 2 AUX terminals 1 A to 2 A, red, for BaseUnit type C0; 10 units

6ES7193-6CP85-2AC0

- Color code CC86, for 2 AUX terminals 1 A to 2 A, blue, for BaseUnit type C0; 10 units

6ES7193-6CP86-2AC0

- Color code CC42, module-specific; for BaseUnit type F0; 10 units

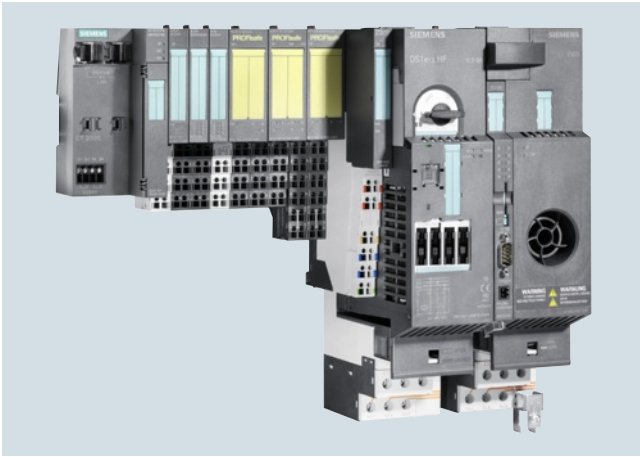
6ES7193-6CP42-2MB0

Shield connection

5 shield connections and 5 shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional ground

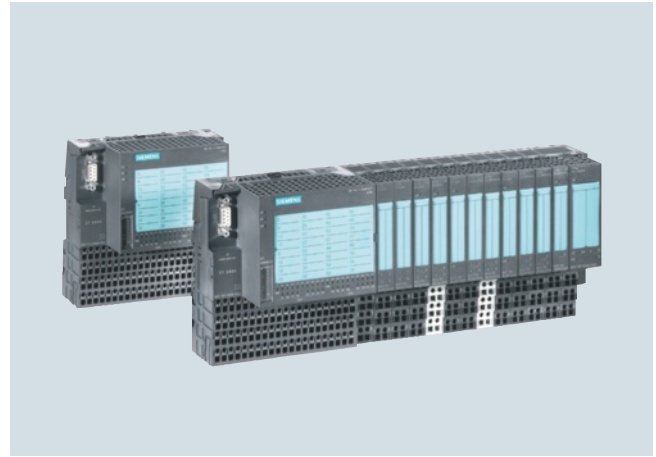
6ES7193-6SC00-1AM0

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
- Bit-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 ATEX 100 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)

I/O systems

ET 200 systems for the control cabinet
ET 200S

Introduction

Technical specifications

General technical specifications	
Degree of protection	IP20
Ambient temperature	0 ... 60 °C
Vibration resistance	2 g continuously, 5 g temporarily (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: Up to 12 modules IM 151-1 COMPACT: Up to 12 modules IM 151-1 STANDARD: Up to 63 modules IM 151-1 HIGH-FEATURE: Up to 63 modules IM 151-7 CPU: Up to 63 modules IM 151-3 PN: Up to 63 modules
• Line width, max.	IM 151-1 BASIC: Up to 2 m IM 151-1 COMPACT: Up to 2 m IM 151-1 STANDARD: Up to 2 m IM 151-1 HIGH-FEATURE: Up to 2 m IM 151-7 CPU: Up to 1 m IM 151-3 PN: Up to 2 m
• User data length	Depending on the number and type of connected modules IM 151-1 BASIC: Up to 88 byte for inputs and outputs IM 151-1 COMPACT: Up to 100 byte for inputs and outputs IM 151-1 STANDARD: Up to 244 byte for inputs and outputs IM 151-1 HIGH-FEATURE: Up to 244 byte for inputs and outputs IM 151-7 CPU: Not relevant IM 151-3 PN: 256 byte
• Parameter length	Depending on the number and type of connected modules IM 151-1 BASIC: 198 byte IM 151-1 COMPACT: 218 byte IM 151-1 STANDARD: Up to 244 byte IM 151-1 HIGH-FEATURE: Up to 244 byte IM 151-7 CPU: Not relevant IM 151-3 PN: Not relevant
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
• Diagnostics length	17 ... 64 byte (adjustable)

General technical specifications	
Standards and approvals	
• 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 acc. to hazardous locations UL 1604, File no. E 222109 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 Bureau Veritas Det Norske Veritas Germanischer Lloyd Lloyds Register of Shipping Nippon Kaiji Kyokai (without motor starters and frequency converters)
• Ex approval Cat. 3 (for Zone 2 acc. to ATEX-100a)	EN 50021 (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 linking the ET 200S to PROFIBUS DP
- Handles all data exchange with the PROFIBUS DP master
- 6 variants:
 - IM151-1 BASIC (RS 485)
 - IM151-1 COMPACT 32DI 24VDC (RS 485)
 - IM151-1 COMPACT 16DI 24VDC / 16DO 24VDC/0.5A (RS 485)
 - IM151-1 STANDARD (RS 485)
 - IM151-1 STANDARD (FO)
 - IM151-1 HIGH FEATURE (RS 485)
- Delivery including connection module

The main differences between the IM151-1 variants:

	IM151-1 BASIC	IM151-1 COMPACT	IM151-1 STANDARD	IM151-1 FO STANDARD	IM151-1 HIGH FEATURE
Article number 6ES7151-	1CA00-0AB0	1CA00-1BL00 1CA00-3BL00	1AA05-0AB0	1AB05-0AB0	1BA02-0AB0
Integral I/O	-	32 DI 16DI / 16 DO	-	-	-
Maximum number of I/O modules	12	12	63	63	63
Maximum station width	2 m	2 m	2 m	1 m	2 m
Maximum number of parameters	198 bytes	218 bytes	244 bytes	244 bytes	244 bytes
Maximum address space for inputs and outputs	88 bytes each	100 bytes each	244 bytes	128 bytes	Depending on the DP master: 244 bytes or not relevant
Maximum diagnostics length	6 to 43 bytes	6 to 44 bytes	6 to 122 bytes	6 to 64 bytes	6 to 128 bytes
Protocol	DP V0	DP V0	DP V0 and DP V1	DP V0	DP V0 and DP V1
DP connection type	RS 485	RS 485	RS 485	Fiber-optic cable	RS 485
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 bytes	8 bytes	32 bytes	8 bytes	32 bytes
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

I/O systems

ET 200 systems for the control cabinet

ET 200S - Interface modules

IM 151-1**Technical specifications**

Article number	6ES7151-1CA00-1BL0 ET 200S COMPACT, 32DI STD, DC24V, 3MS	6ES7151-1CA00-3BL0 ET 200S COMPACT, 16DI/16DO STD, DC24V
Product type designation		
General information		
Vendor identification (VendorID)		8200H
Supply voltage		
Load voltage 1L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
Input current		
from supply voltage 1L+, max.	100 mA; 100	100 mA
Address area		
Addressing volume		
• Inputs	100 byte	100 byte
• Outputs	100 byte	100 byte
Digital inputs		
Number of digital inputs	32	16
Input voltage		
• Type of input voltage	DC	DC
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V
• for signal "1"	13 to 30V	13 to 30V
Input current		
• for signal "1", typ.	4 mA; At 24 V min. 2 mA	3 mA
Input delay (for rated value of input voltage) for standard inputs		
- at "0" to "1", min.	3 ms	3 ms
- at "0" to "1", max.	3 ms	3 ms
Cable length		
• Unshielded, max.	1 000 m	1 000 m
Digital outputs		
Number of digital outputs	0	16
short-circuit protection		Yes
Limitation of inductive shutdown voltage to		L+ (-55 to -60 V)
Controlling a digital input		Yes
Switching capacity of the outputs		
• on lamp load, max.		5 W
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)		
all mounting positions		
- up to 60 °C, max.		2 A
Cable length		
• Unshielded, max.		1 000 m

Technical specifications (continued)

Article number	6ES7151-1CA00-1BL0 ET 200S COMPACT, 32DI STD, DC24V, 3MS	6ES7151-1CA00-3BL0 ET 200S COMPACT, 16DI/16DO STD, DC24V
Encoder		
Connectable encoders		
<ul style="list-style-type: none"> 2-wire sensor - Permissible quiescent current (2-wire sensor), max. 		Yes 1.5 mA
Interfaces		
Interface physics, RS 485	Yes	Yes
Interface physics, FOC	No	No
PROFINET IO		
<ul style="list-style-type: none"> Transmission rate, max. 		12 Mbit/s
PROFIBUS DP		
<ul style="list-style-type: none"> Output current, max. Transmission procedure Direct data exchange (slave-to-slave communication) 	RS 485 Yes	80 mA RS 485 Yes
Cable length		
- Cable length, max.	1 200 m	1 200 m
Protocols		
PROFINET IO	No	No
PROFIBUS DP	Yes	Yes
Protocols (Ethernet)		
<ul style="list-style-type: none"> TCP/IP 	No	No
Isochronous mode		
Isochronous operation (application synchronized up to terminal)	No	No
Interrupts/diagnostics/status information		
Alarms		
<ul style="list-style-type: none"> Alarms 	No	No
Diagnostic messages		
<ul style="list-style-type: none"> Diagnostic functions 	Yes	Yes
Diagnostics indication LED		
<ul style="list-style-type: none"> Run mode RUN (green) Group error SF (red) Status indicator digital output (green) Status indicator digital input (green) Monitoring 24 V voltage supply ON (green) Connection to network LINK (green) Transmit/receive RX/TX (yellow) 	Yes Yes Yes Yes Yes No No	Yes Yes Yes Yes Yes No No
Galvanic isolation		
between backplane bus and electronics		No
between supply voltage and electronics		No
Galvanic isolation digital inputs		
<ul style="list-style-type: none"> Galvanic isolation digital inputs 		No
Galvanic isolation digital outputs		
<ul style="list-style-type: none"> Galvanic isolation digital outputs 		Yes
Isolation		
Isolation checked with	500 V DC	500 V DC
Degree and class of protection		
Degree of protection to EN 60529		
<ul style="list-style-type: none"> IP20 	Yes	Yes
Connection method		
Inputs/outputs		Screw-type and spring-loaded terminals, permanent wiring; 3 and 4-wire connection

I/O systems

ET 200 systems for the control cabinet

ET 200S - Interface modules

IM 151-1

Technical specifications (continued)

Article number	6ES7151-1CA00-1BL0 ET 200S COMPACT, 32DI STD, DC24V, 3MS	6ES7151-1CA00-3BL0 ET 200S COMPACT, 16DI/16DO STD, DC24V		
Dimensions				
Width	120 mm	120 mm		
Height	81 mm	81 mm		
Depth	758 mm; 58	58 mm		
Weights				
Weight, approx.	230 g; EB only			
Article number	6ES7151-1AA05-0AB0 ET200S, IM151-1 STD, 12MBIT/S	6ES7151-1AB05-0AB0 ET200S, INTERFACE MODULE IM151-1 FO	6ES7151-1BA02-0AB0 ET200S, INTERF.MOD. IM151-1 HF, 12MBIT/S	6ES7151-1CA00-0AB0 ET200S, IM151-1 BASIC, 12MBIT/S
Product type designation				
General information				
Vendor identification (VendorID)	806Ah	806Bh		80F3h
Supply voltage				
Mains buffering				
• Mains/voltage failure stored energy time	20 ms	20 ms	20 ms	No
Input current				
from supply voltage 1L+, max.	200 mA	200 mA	200 mA	70 mA
Output current				
Current output to backplane bus (DC 5 V), max.		700 mA		
Power losses				
Power loss, typ.	3.3 W	3.3 W	3.3 W	1.5 W
Address area				
Addressing volume				
• Inputs	244 byte	244 byte	244 byte	88 byte
• Outputs	244 byte	244 byte	244 byte	88 byte
Interfaces				
Interface physics, RS 485	Yes; 9-pin sub D socket		Yes	Yes; 9-pin sub D socket
Interface physics, FOC		Yes; 4 x Simplex socket		
PROFIBUS DP				
• Output current, max.	80 mA			80 mA
• 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
• Transmission procedure	RS 485			
• SYNC capability	Yes	Yes	Yes	Yes
• FREEZE capability	Yes	Yes	Yes	Yes
• Direct data exchange (slave-to-slave communication)	Yes	Yes	Yes	Yes
Cable length				
- Cable length, max.	1 200 m	2 m		
Protocols				
PROFIBUS DP	Yes	Yes	Yes	Yes
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	Yes	No
Interrupts/diagnostics/status information				
Alarms				
• Alarms	Yes	Yes	Yes	No
Diagnostic messages				
• Diagnostic functions	Yes	Yes	Yes	Yes
Diagnostics 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

Technical specifications (continued)

Article number	6ES7151-1AA05-0AB0 ET200S, IM151-1 STD, 12MBIT/S	6ES7151-1AB05-0AB0 ET200S, INTERFACE MODULE IM151-1 FO	6ES7151-1BA02-0AB0 ET200S, INTERF.MOD. IM151-1 HF, 12MBIT/S	6ES7151-1CA00-0AB0 ET200S, IM151-1 BASIC, 12MBIT/S
Galvanic isolation				
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
Permissible potential difference				
between different circuits	75V DC/60V AC	500 V DC	75V DC/60V AC	75V DC/60V AC
Isolation				
Isolation checked with	500 V DC	57V DC/60V AC	500 V DC	500 V DC
Standards, approvals, certificates				
CE mark	Yes		Yes	
UL approval	Yes		Yes	
Ambient conditions				
Ambient temperature in operation				
• Min.	0 °C		0 °C	
• max.	60 °C		60 °C	
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
Weights				
Weight, approx.	150 g	150 g	150 g	150 g

Ordering data

	Article No.		Article No.
IM 151-1 BASIC interface module 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	6ES7151-1CA00-0AB0	IM 151-1 STANDARD interface module for ET 200S; transfer rates up to 12 Mbit/s; data volumes 244 bytes 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	6ES7151-1AA05-0AB0
IM 151-1 COMPACT 32 DI 24 V DC interface module 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	6ES7151-1CA00-1BL0	IM 151-1 FO STANDARD interface module for ET 200S, transfer rates up to 12 Mbit/s; data volumes 244 bytes 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	6ES7151-1AB05-0AB0
IM 151-1 COMPACT 16 DI 24 V DC / 16 DO 24 V/0.5 A interface module 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	6ES7151-1CA00-3BL0	IM 151-1 HIGH FEATURE interface module for ET 200S; transfer rate up to 12 Mbit/s; data volumes 244 bytes 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	6ES7151-1BA02-0AB0

I/O systems

ET 200 systems for the control cabinet
ET 200S - Interface modules

IM 151-1

Ordering data	Article No.	Article No.
Accessories		
TM-C120S terminal module Terminal module for ET 200S COMPACT, screw-type terminals	6ES7193-4DL10-0AA0	
TM-C120C terminal module Terminal module for ET 200S COMPACT, spring-loaded terminals	6ES7193-4DL00-0AA0	
TE-U120S4x10 add-on terminal 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	6ES7193-4FL10-0AA0	
TE-U120C4x10 add-on terminal 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	6ES7193-4FL00-0AA0	
ET 200S distributed I/O system manuals are available on the Internet as PDF files: http://www.siemens.com/simatic-docu		
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)	6ES7998-8XC01-8YE0	
SIMATIC Manual Collection – Update service for 1 year Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	6ES7998-8XC01-8YE2	
		PROFIBUS DP bus connector RS 485 With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbit/s Without PG interface • 1 unit • 100 units With PG interface • 1 unit • 100 units
		100 Simplex connectors For plastic fiber-optic cable incl. 5 polishing sets
		50 plug adapters For 2 Simplex connectors each
		Label sheets DIN A4 (10 pieces) Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules • petrol • red • yellow • light beige
		Label sheets DIN A4 (10 pieces) Can be used for ET 200S COMPACT. Each sheet has 10 labeling strips • beige • yellow • red • petrol
		Termination module as spare part for ET 200S
		Power supply connector Spare part; for connecting the 24 V DC supply voltage • with push-in terminals • with screw-type terminals
		SIMATIC S5, 35 mm DIN rail • Length: 483 mm for 19" cabinets • Length: 530 mm for 600 mm cabinets • Length: 830 mm for 900 mm cabinets • Length: 2 m
		6ES7972-0BA52-0XA0 6ES7972-0BA52-0XB0 6ES7972-0BB52-0XA0 6ES7972-0BB52-0XB0 6GK1901-0FB00-0AA0 6ES7195-1BE00-0XA0 6ES7193-4BH00-0AA0 6ES7193-4BD00-0AA0 6ES7193-4BB00-0AA0 6ES7193-4BA00-0AA0 6ES7193-4BA10-0AA0 6ES7193-4BB10-0AA0 6ES7193-4BD10-0AA0 6ES7193-4BH10-0AA0 6ES7193-4JA00-0AA0 6ES7193-4JB00-0AA0 6ES7193-4JB50-0AA0 6ES5710-8MA11 6ES5710-8MA21 6ES5710-8MA31 6ES5710-8MA41

Overview



- Interface module for linking the ET 200S to PROFINET
- Handles all data exchange with the PROFINET IO 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 connecting module

Note:

Micro Memory Card required for operation depending on the configuration.

Technical specifications

Article number	6ES7151-3AA23-0AB0	6ES7151-3BA23-0AB0
	ET200S, IM151-3 PN ST INTERFACEMODULE	ET200S, IM151-3 PN HF INTERFACEMODULE
Product type designation		
Supply voltage		
Mains buffering		
• Mains/voltage failure stored energy time		20 ms
Input current		
from supply voltage 1L+, max.		200 mA
Power losses		
Power loss, typ.		3.3 W
Address area		
Addressing volume		
• Inputs		256 byte
• Outputs		256 byte
Interfaces		
PROFINET IO		
• Number of PROFINET interfaces		1
• Autocrossing		Yes
• Automatic detection of transmission speed		Yes
• Transmission rate, max.		100 Mbit/s
• Services		Ping; arp; LLDP; network diagnostics (SNMP) / MIB-2, reset SNMP parameters to factory settings; prioritized startup; media redundancy MRP; shared device
• RJ 45		Yes
1st interface		
Functionality		
• PROFINET IO Device		Yes
PROFINET IO Device Services		
- Isochronous mode		Yes
- IRT		Yes
- PROFIenergy		Yes
- Prioritized startup		Yes
- Shared device		Yes
- Number of IO controllers with shared device, max.		2

I/O systems

ET 200 systems for the control cabinet

ET 200S - Interface modules

IM 151-3 PN**Technical specifications** (continued)

Article number	6ES7151-3AA23-0AB0 ET200S, IM151-3 PN ST INTERFACEMODULE	6ES7151-3BA23-0AB0 ET200S, IM151-3 PN HF INTERFACEMODULE
Protocols		
PROFINET IO	Yes	Yes
IRT		Yes
MRP		Yes
Protocols (Ethernet)		
• SNMP		Yes
• LLDP		Yes
• ping		Yes
• ARP		Yes
Interrupts/diagnostics/ status information		
Alarms		
• Alarms		Yes
Diagnostic messages		
• Diagnostic functions		Yes
Diagnostics indication LED		
• Bus fault BF (red)		Yes
• Group error SF (red)		Yes
• Monitoring 24 V voltage supply ON (green)		Yes
• Connection to network LINK (green)		Yes
Galvanic isolation		
between backplane bus and electronics		No
between supply voltage and electronics		No
between Ethernet and electronics		Yes
Permissible potential difference		
between different circuits		75V DC/60V AC
Isolation		
Isolation checked with		500 V
Standards, approvals, certificates		
CE mark		Yes
UL approval		Yes
Ambient conditions		
Ambient temperature in operation		
• Min.		0 °C
• max.		60 °C
Dimensions		
Width	60 mm	60 mm
Height	119.5 mm	119.5 mm
Depth	75 mm	75 mm; with mounting rail
Weights		
Weight, approx.		150 g

Ordering data**Article No.****Article 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

6ES7151-3AA23-0AB0**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

6ES7151-3BA23-0AB0**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

6ES7151-3BB23-0AB0

Ordering data	Article No.	Article No.
Accessories		ET 200S distributed I/O system manuals
Industrial Ethernet FC RJ45 Plug 90		are available on the Internet as PDF files: http://www.siemens.com/simatic-docu
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	6GK1901-1BB20-2AA0	SIMATIC Manual Collection
10 units	6GK1901-1BB20-2AB0	6ES7998-8XC01-8YE0
50 units	6GK1901-1BB20-2AE0	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)
Industrial Ethernet FastConnect installation cables		SIMATIC Manual Collection – Update service for 1 year
FastConnect standard cable	6XV1840-2AH10	6ES7998-8XC01-8YE2
FastConnect trailing cable	6XV1840-3AH10	Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates
FastConnect marine cable	6XV1840-4AH10	
Termination Kits		Label sheets DIN A4 (10 pieces)
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	6GK1900-0ML00-0AA0	Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules
IE SC RJ POF Plug Screw-in plug for on-site assembly to POF fiber optic cable (1 pack = 20 units)	6GK1900-0MB00-0AC0	<ul style="list-style-type: none"> • petrol 6ES7193-4BH00-0AA0 • red 6ES7193-4BD00-0AA0 • yellow 6ES7193-4BB00-0AA0 • light beige 6ES7193-4BA00-0AA0
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)	6GK1900-0MN00-0AA0	Termination module
SC RJ PCF Plug Assembly case for on-site assembly of SC RJ plugs consisting of stripping tool, buffer stripping tool, kevlar cutter, fiber breaking tool, microscope	6GK1900-0NL00-0AA0	6ES7193-4JA00-0AA0
Industrial Ethernet SC RJ PCF Plug Screw-in plug for on-site assembly to PCF fiber optic cable (1 pack = 10 units)	6GK1900-0NB00-0AC0	as spare part for ET 200S
Industrial Ethernet FastConnect stripping tool	6GK1901-1GA00	Power supply connector
MMC 64 KB ¹⁾	6ES7953-8LF30-0AA0	Spare part; for connecting the 24 V DC supply voltage
For storing the device name		<ul style="list-style-type: none"> • with push-in terminals 6ES7193-4JB00-0AA0 • with screw-type terminals 6ES7193-4JB50-0AA0
MMC 128 KB ¹⁾	6ES7953-8LG30-0AA0	DIN rail 35 mm
For storing the device name		<ul style="list-style-type: none"> • Length: 483 mm for 19" cabinets 6ES5710-8MA11 • Length: 530 mm for 600 mm cabinets 6ES5710-8MA21 • Length: 830 mm for 900 mm cabinets 6ES5710-8MA31 • Length: 2 m 6ES5710-8MA41
MMC 512 KB ¹⁾	6ES7953-8LJ30-0AA0	Industrial Ethernet Switches
For storing the device name		Managed Industrial Ethernet Switches; Isochronous real time, LED diagnostics, fault signaling contact with SET button, redundant power supply
MMC 2 MB ¹⁾	6ES7953-8LL31-0AA0	<ul style="list-style-type: none"> • SCALANCE X202-2P IRT; 2 x 10/100 Mbit/s RJ45 ports, 2 x 100 Mbit/s POF/PCF SC RJ 6GK5202-2BH00-2BA3 • SCALANCE X201-3P IRT; 1 x 10/100 Mbit/s RJ45 ports, 3 x 100 Mbit/s POF/PCF SC RJ 6GK5201-3BH00-2BA3 • SCALANCE X200-4P IRT; 4 x 100 Mbit/s POF/PCF SC RJ 6GK5200-4AH00-2BA3
MMC 4 MB ¹⁾	6ES7953-8LM31-0AA0	
For storing the device name and/or firmware update		
MMC 8 MB ¹⁾	6ES7953-8LP31-0AA0	
For storing the device name and/or firmware update		

¹⁾ For operating the IM 151-3, an MMC is essential

I/O systems

ET 200 systems for the control cabinet
ET 200S - Interface modules

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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1151-1AA05-7AB0	6AG1151-1BA02-2AB0
Based on	6ES7151-1AA05-0AB0 SIPLUS ET200S IM 151-1 STANDARD	6ES7151-1BA02-0AB0 SIPLUS ET200S IM151 HF
Ambient conditions		
Ambient temperature in operation		
• Min.		-25 °C; = Tmin
• max.		60 °C; = Tmax
Extended ambient conditions		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity		
- With condensation, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

SIPLUS IM 151-1 STANDARD interface module

(extended temperature range and medial exposure)

for ET 200S; transfer rates up to 12 Mbit/s; data volumes 244 bytes 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

Article No.

6AG1151-1AA05-7AB0

SIPLUS IM 151-1 HIGH FEATURE interface module

(extended temperature range and medial exposure)

for ET 200S; transfer rate up to 12 Mbit/s; data volumes 244 bytes each for inputs and outputs, up to 63 modules can be connected; connection of PROFIsafe modules, isochronous mode (clock synchronization); bus connection via 9-pin Sub-D incl. terminating module

Article No.

6AG1151-1BA02-2AB0

Accessories

See SIMATIC IM 151-1, page 9/114

Overview



- Interface module for linking the ET 200S PROFINET
- Handles all data exchange with the PROFINET IO controller
- IM 151-3 PN STANDARD
- With integrated 2-port switch for line topology

Micro Memory Card required for operation of CPU.

Note:

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

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1151-3AA23-2AB0	6AG1151-3AA23-7AB0
Based on	6ES7151-3AA23-0AB0 SIPLUS ET200S IM151-3 ST	6ES7151-3AA23-0AB0 SIPLUS ET200S IM151-3 ST
Product type designation		
Standards, approvals, certificates		
CE mark	Yes	Yes
Ambient conditions		
Ambient temperature in operation		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	70 °C; = Tmax
Extended ambient conditions		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

I/O systems

ET 200 systems for the control cabinet

ET 200S - Interface modules

SIPLUS IM 151-3PN

Ordering data	Article No.		Article No.
<p>SIPLUS IM 151-3 PN interface module</p> <p>(extended temperature range and medial exposure)</p> <p>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</p>	<p>6AG1151-3AA23-2AB0</p>	<p>SIPLUS IM 151-3 PN PROFINET High Feature interface module</p> <p>(extended temperature range and medial exposure)</p> <p>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</p> <p>Accessories</p>	<p>6AG1151-3BA23-7AB0</p> <p>See SIMATIC IM 151-3 PN interface module, page 9/117</p>

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.
- Diagnostics 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)
- PM-E 24 to 48 V DC
 - 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 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

Article number	6ES7138-4CA01-0AA0	6ES7138-4CB11-0AB0
	ET200S, POWER MODULE PM-E, 24V DC	ET200S, POWERMOD.PM-E;DC24-48V/AC24-230V
Product type designation		
Supply voltage		
Load voltage L+		
• Rated value (DC)	24 V	
• short-circuit protection	No; external (e.g. automatic circuit breaker), tripping characteristic C	
• Reverse polarity protection	Yes	
Input current		
from load voltage 1L+ (without load), max.	4 mA	
Current carrying capacity		
up to 60 °C, max.	10 A	
Power losses		
Power loss, typ.	0.1 W	
Interrupts/diagnostics/status information		
Diagnostic messages		
• Diagnostics	Yes	
• Missing load voltage	Yes	
Diagnostics indication LED		
• Rated load voltage PWR (green)	Yes	
• Group error SF (red)	Yes	
Parameter		
Remark	3 byte	
Missing load voltage	Disable / enable	
Galvanic isolation		
primary/secondary	Yes; between rated load voltage and backplane bus, between power modules	
Isolation		
Isolation checked with	500 V DC	
Dimensions		
Width	15 mm	15 mm
Height	81 mm	81 mm
Depth	52 mm	52 mm
Weights		
Weight, approx.	35 g	

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Power modules for PM-E electronic modules**Technical specifications** (continued)

Article number	6ES7138-4CA50-0AB0	6ES7138-4CA60-0AB0
	ET200S, POWERMOD. PM-E, DC 24-48V	ET200S, POWERMOD. PM-E HF, DC24V
Product type designation		
Supply voltage		
Load voltage L+		
<ul style="list-style-type: none"> Rated values short-circuit protection Reverse polarity protection 	24 to 48 V DC No; external (e.g. automatic circuit breaker), tripping characteristic B, C Yes	
Input current		
from load voltage 1L+ (without load), max.	12 mA	
Current carrying capacity		
up to 60 °C, max.	10 A	
Power losses		
Power loss, typ.	500 mW	
Interrupts/diagnostics/status information		
Diagnostic messages		
<ul style="list-style-type: none"> Diagnostics Missing load voltage 	Yes Yes	
Diagnostics indication LED		
<ul style="list-style-type: none"> Rated load voltage PWR (green) Group error SF (red) 	Yes Yes	
Parameter		
Remark	3 byte	
Missing load voltage	Disable / enable	
Galvanic isolation		
primary/secondary	Yes; between rated load voltage and backplane bus, between power modules	
Isolation		
Isolation checked with	500 V DC	
Dimensions		
Width	15 mm	15 mm
Height	81 mm	81 mm
Depth	52 mm	52 mm
Weights		
Weight, approx.	35 g	

Ordering data	Article No.	Accessories	Article No.
PM-E 24 V DC Standard power module ¹⁾ For electronic modules; with diagnostics 1 unit 5 units	6ES7138-4CA01-0AA0 6ES7138-4CA01-1AA0	Label sheets DIN A4 (10 pieces) Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules • petrol • red • yellow • light beige	6ES7193-4BH00-0AA0 6ES7193-4BD00-0AA0 6ES7193-4BB00-0AA0 6ES7193-4BA00-0AA0
PM-E 24 V DC High Feature power module ¹⁾ For electronic modules; with diagnostics	6ES7138-4CA60-0AB0		
PM-E 24 to 48 V DC power module For electronic modules; with diagnostics, with status bit "load voltage" present 1 unit 5 units	6ES7138-4CA50-0AB0 6ES7138-4CA50-1AB0		
PM-E 24 to 48 V DC, 42 to 230 V AC power module For electronic modules; with diagnostics and fuse	6ES7138-4CB11-0AB0		

¹⁾ 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

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
Article number 6ES7193...	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
Article number 6ES7193...	4CC30-0AA0	4CD30-0AA0	4CE10-0AA0	4CK30-0AA0
FastConnect type designation	TM-P15N23-A1	TM-P15N23-A0	TM-P15N22-01	Soon to come
Article number 6ES7193...	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 PROFIsafe				•

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

SIPLUS 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
- Diagnostics message for voltage and blown fuse (can be switched off via configuration)
- Fail-safe PM-E F PROFIsafe power module for safely switching off 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 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:
<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1138-4CA01-2AA0	6AG1138-4CB11-2AB0	6AG1138-4CA50-2AB0
Based on	6ES7138-4CA01-0AA0 SIPLUS DP PM-E ET200S	6ES7138-4CA50-0AB0 SIPLUS ET200S PM-E DC/AC	6ES7138-4CB11-0AB0 SIPLUS ET200S PM 24V-48V
Ambient conditions			
Ambient temperature in operation			
• Min.	-40 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
Extended ambient conditions			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity			
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

SIPLUS power modules for PM-E electronic modules

Ordering data	Article No.	Article No.
SIPLUS PM-E power modules (extended temperature range and medial exposure)		
PM-E 24 V DC power module ¹⁾ For electronic modules; with diagnostics	6AG1138-4CA01-2AA0	
PM-E 24 to 48 V DC power module For electronic modules; with diagnostics; with status bit "load voltage" present	6AG1138-4CA50-2AB0	
		PM-E 24 to 48 V DC, 24 to 230 V AC power module For electronic modules; with diagnostics and fuse
		Accessories See SIMATIC PM-E power modules, page 9/123
		6AG1138-4CB11-2AB0

¹⁾ 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

Selection tool for terminal modules

Power modules	Terminal modules TM-P for power modules			
Screw-type terminal type designation	TM-P15S23-A1	TM-P15S23-A0	TM-P15S22-01	TM-P30S44-A0
Article number 6ES7193...	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
Article number 6ES7193...	4CC30-0AA0	4CD30-0AA0	4CE10-0AA0	4CK30-0AA0
FastConnect type designation	TM-P15N23-A1	TM-P15N23-A0	TM-P15N22-01	Soon to come
Article number 6ES7193...	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 PROFIsafe				•

I/O systems

ET 200 systems for the control cabinet
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 reserve 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 reserve 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

Article number	6ES7138-4AA01-0AA0	6ES7138-4AA11-0AA0
	ET200S, RESERVE MODULE , 15MM, 5PCS	ET200S, RESERVE MODULE, 30MM, 1PC
Product type designation		
Installation type/mounting		
Wall mounting/direct mounting possible	Yes	Yes
Power losses		
Power loss, typ.	0.025 W	0.025 W
Address area		
Occupied address area		
• Inputs	according to configured module	according to configured module
Digital inputs		
Number of digital inputs	0	0
Interrupts/diagnostics/status information		
Diagnostic messages		
• Diagnostic functions	No	No
Diagnostics indication LED		
• Status indicator digital input (green)	No	No
Parameter		
Remark	according to configured module	according to configured module
Dimensions		
Width	15 mm	30 mm
Height	81 mm	81 mm
Depth	52 mm	52 mm
Weights		
Weight, approx.	33 g	55 g

Ordering data

Article No.

Reserve modules for ET 200S

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

6ES7138-4AA01-0AA0
6ES7138-4AA11-0AA0

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

Potential isolation module	6ES7138-4FD00-0AA0
Module-specific specifications	
Supported synchronous operation	no
Number of outputs	4
Cable length	
• Unshielded	max. 600 m
• Shielded	max. 1000 m
Parameter length	1 byte
Voltages, Currents, Potentials	
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
Data for selecting an actuator	
Short-circuit protection for the output	No, possible via PM-E or external
Dimensions and weight	
Dimensions W × H × D (mm, the total dimensions depend on the selected terminal module)	15 × 81 × 52
Weight	Approx. 33 g

Ordering data

Article No.

Potential isolation module for ET 200S

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

6ES7138-4FD00-0AA0

Accessories for labeling

Label sheets DIN A4 (10 pieces)

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

- petrol
- red
- yellow
- light beige

6ES7193-4BH00-0AA0
6ES7193-4BD00-0AA0
6ES7193-4BB00-0AA0
6ES7193-4BA00-0AA0

I/O systems

ET 200 systems for the control cabinet

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

Technical specifications

Article number	6ES7131-4BB01-0AA0	6ES7131-4BB01-0AB0	6ES7131-4BD01-0AA0	6ES7131-4BD01-0AB0	6ES7131-4BD51-0AA0	6ES7131-4BF00-0AA0
	ET200S, EL-MOD., 2DI ST, DC 24V, 5PCS.	ET200S, EL-MOD., 2DI HF, DC 24V, 5PCS.	ET200S, EL-MOD., 4DI ST., DC 24V, 5PCS.	ET200S, EL-MOD., 4DI HF, DC 24V, 5PC.	ET200S, EL-MOD., 4DI HF, DC 24V, 5PCS.	ET200S, ELEKTRONIC MODULE, 8DI DC 24V
Product type designation						
Supply voltage						
Rated value (DC)						
• 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
Input current						
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
Encoder supply						
Number of outputs						0; no encoder supply
Type of 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	
short-circuit protection		Yes; Electronic		Yes; Electronic		
Output current						
• nominal	500 mA	500 mA	500 mA	500 mA	500 mA	
Power losses						
Power loss, typ.	0.4 W	0.4 W	0.7 W	0.7 W	0.7 W	1.2 W
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

Technical specifications (continued)

Article number	6ES7131-4BB01-0AA0 ET200S, EL-MOD., 2DI ST, DC 24V, 5PCS.	6ES7131-4BB01-0AB0 ET200S, EL-MOD., 2DI HF, DC 24V, 5PCS.	6ES7131-4BD01-0AA0 ET200S, EL-MOD., 4DI ST., DC 24V, 5PCS.	6ES7131-4BD01-0AB0 ET200S, EL-MOD., 4DI HF, DC 24V, 5PC.	6ES7131-4BD51-0AA0 ET200S, EL-MOD., 4DI HF, DC 24V, 5PCS.	6ES7131-4BF00-0AA0 ET200S, ELEKTRONIC MODULE, 8DI DC 24V
Digital inputs						
Number of digital inputs	2	2	4	4	4	8
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes	Yes	Yes; 2-wire sensors connectable
Number of simultaneously controllable inputs						
• Number of simultaneously controllable inputs						8
Input voltage						
• Type of input voltage	DC	DC	DC	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V	-30 to +5V	-30 to +5V	-5 to +30V	-30 to +5V
• for signal "1"		+11 to +30V		+11 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
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						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
Encoder						
Connectable encoders						
• 2-wire sensor	Yes	Yes	Yes	Yes	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA
Isochronous mode						
Isochronous operation (application synchronized up to terminal)						Yes; TWE = 3000 us
Diagnostic messages						
• 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		
Diagnostics 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
Parameter						
Remark	1 byte	3 byte	1 byte	3 byte	1 byte	3-byte parameter (not accessible for the user)
Diagnosis: short circuit		Disable / enable		Disable / enable		

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Digital electronic modules

Technical specifications (continued)

Article number	6ES7131-4BB01-0AA0 ET200S, EL-MOD., 2DI ST, DC 24V, 5PCS.	6ES7131-4BB01-0AB0 ET200S, EL-MOD., 2DI HF, DC 24V, 5PCS.	6ES7131-4BD01-0AA0 ET200S, EL-MOD., 4DI ST., DC 24V, 5PCS.	6ES7131-4BD01-0AB0 ET200S, EL-MOD., 4DI HF, DC 24V, 5PC.	6ES7131-4BD51-0AA0 ET200S, EL-MOD., 4DI HF, DC 24V, 5PCS.	6ES7131-4BF00-0AA0 ET200S, ELEKTRONIC MODULE, 8DI DC 24V
Galvanic isolation						
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
Permissible potential difference						
between different circuits	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
Isolation						
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC
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
Weights						
Weight, approx.	35 g	35 g	35 g	35 g	35 g	35 g
Article number	6ES7131-4CD02-0AB0 ET200S, EL-MOD., 4DI, UC 24-48V, 5 PCS	6ES7131-4EB00-0AB0 ET200S, EL-MOD., 2DI, AC 120V, 5PCS.	6ES7131-4FB00-0AB0 ET200S, EL-MOD., 2DI, AC 230V, 5PCS.	6ES7131-4RD02-0AB0 ET200S, EL-MOD., 4DI DC 24V NAMUR	6ES7131-4BF50-0AA0 ET200S, 8DI SOURCE OUTPUT DC24V	
Product type designation						
Supply voltage						
Rated value (DC)						
• 24 V DC				Yes		Yes; From power module
permissible range, lower limit (DC)				20.4 V		20.4 V
permissible range, upper limit (DC)				28.8 V		28.8 V
Rated value (AC)						
• 120 V AC		Yes; From power module				
• 230 V AC			Yes			
Reverse polarity protection						Yes
Input current						
from backplane bus 3.3 V DC, max.		6 mA	6 mA			
from supply voltage L+, max.						Dependent on encoder
from supply voltage L1, max.		Dependent on encoder	Dependent on encoder			
Encoder supply						
Number of outputs				1		
Type of output voltage				min. 8.2 V, loaded		
short-circuit protection				Yes; Electronic		
Output current						
• nominal				45 mA		
Power losses						
Power loss, typ.		0.5 W	0.7 W	1.6 W		1.2 W
Address space per module						
• with packing		2 bit	2 bit	4 bit		
• without packing		1 byte	1 byte	1 byte		

Technical specifications (continued)

Article number	6ES7131-4CD02-0AB0 ET200S, EL-MOD., 4DI, UC 24-48V, 5 PCS	6ES7131-4EB00-0AB0 ET200S, EL-MOD., 2DI, AC 120V, 5PCS.	6ES7131-4FB00-0AB0 ET200S, EL-MOD., 2DI, AC 230V, 5PCS.	6ES7131-4RD02-0AB0 ET200S, EL-MOD., 4DI DC 24V NAMUR	6ES7131-4BF50-0AA0 ET200S, 8DI SOURCE OUTPUT DC24V
Digital inputs					
Number of digital inputs		2	2	4	8
Number of NAMUR inputs				4	
Parallel switching of inputs				No	
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes		Yes
Number of simultaneously controllable inputs					
• Number of simultaneously controllable inputs				4	
Input voltage					
• Type of input voltage		AC	AC	DC	DC
• Rated value (AC)		120 V	230 V		
• Rated value (DC)					24 V
• for signal "0"		0V AC to 20V AC	0V AC to 40V AC		-5 to +30V
• for signal "1"		79 to 132 V AC	164V AC to 264V AC		-15 to -30 V
• Frequency range		47 ... 63 Hz	47 ... 63 Hz		
Input current					
• for signal "1", typ.		3 mA; 3 to 9 mA	5 mA; 5 to 15mA		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 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.				4.6 μs	4.5 ms
- at "1" to "0", min.		25 ms	45 ms		2 ms
- at "1" to "0", max.				4.6 μs	4.5 ms
Cable length					
• shielded, max.		1 000 m	1 000 m	200 m	1 000 m
• Unshielded, max.		600 m	600 m		600 m
Encoder					
Connectable encoders					
• 2-wire sensor		No	No		Yes
- Permissible quiescent current (2-wire sensor), max.		1 mA	2 mA		1.5 mA
Isochronous mode					
Isochronous operation (application synchronized up to terminal)		No	No		Yes
Interrupts/diagnostics/status information					
Alarms					
• Diagnostic alarm				Yes; can be set	
• Hardware interrupt				No	
Diagnostic messages					
• Diagnostic functions		No	No	Yes; Diagnostic alarm	No
• Diagnostic information readable				Yes	
• Short circuit		No	No		
Diagnostics indication LED					
• Group error SF (red)				Yes	No
• Status indicator digital input (green)		Yes; per channel	Yes; per channel	Yes; per channel	Yes; per channel

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Digital electronic modules

Technical specifications (continued)

Article number	6ES7131-4CD02-0AB0 ET200S, EL-MOD., 4DI, UC 24-48V, 5 PCS	6ES7131-4EB00-0AB0 ET200S, EL-MOD., 2DI, AC 120V, 5PCS.	6ES7131-4FB00-0AB0 ET200S, EL-MOD., 2DI, AC 230V, 5PCS.	6ES7131-4RD02-0AB0 ET200S, EL-MOD., 4DI DC 24V NAMUR	6ES7131-4BF50-0AA0 ET200S, 8DI SOURCE OUTPUT DC24V	
Parameter						
Remark		3 byte	3 byte	12 byte	3 byte	
Galvanic isolation						
Galvanic isolation digital 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		
Permissible potential difference						
between different circuits				75V DC/60V AC	75V DC/60V AC	
between M internally and the inputs		1500 V AC	1500 V AC			
Isolation						
Isolation checked with		2500 V DC	4000 VDC	500 V DC	500 V DC	
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	
Weights						
Weight, approx.		31 g	31 g	35 g	35 g	
Article number	6ES7132-4BB01-0AB0 ET200S, EL-MOD., 2DO HF,DC24V, 0.5A, 5PC	6ES7132-4BB01-0AA0 ET200S, EL-MOD., 2DO ST,DC24V, 0.5A, 5PC	6ES7132-4BB31-0AB0 ET200S, EL-MOD., 2DO HF, DC 24V, 2A, 5PC	6ES7132-4BB31-0AA0 ET200S, EL-MOD., 2DO ST, DC 24V, 2A, 5PC	6ES7132-4BD00-0AB0 ET200S, EL-MOD., 4DO HF,DC24V, 0.5A,5PCS	6ES7132-4BD02-0AA0 ET200S, EL-MOD., 4DO ST,DC24V, 0.5A,5PCS
Product type designation						
Supply voltage						
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 power module
• 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
Input current						
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
Power losses						
Power loss, typ.	0.4 W	0.4 W	1.4 W	1.4 W		0.8 W
Address area						
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

Technical specifications (continued)

Article number	6ES7132-4BB01-0AB0 ET200S, EL-MOD., 2DO HF,DC24V, 0.5A, 5PC	6ES7132-4BB01-0AA0 ET200S, EL-MOD., 2DO ST,DC24V, 0.5A, 5PC	6ES7132-4BB31-0AB0 ET200S, EL-MOD., 2DO HF, DC 24V, 2A, 5PC	6ES7132-4BB31-0AA0 ET200S, EL-MOD., 2DO ST, DC 24V, 2A, 5PC	6ES7132-4BD00-0AB0 ET200S, EL-MOD., 4DO HF,DC24V, 0.5A,5PCS	6ES7132-4BD02-0AA0 ET200S, EL-MOD., 4DO ST,DC24V, 0.5A,5PCS
Digital outputs						
Number of digital outputs	2	2	2	2	4	4
short-circuit protection	Yes	Yes	Yes	Yes	Yes	Yes
• 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
Controlling a digital input	Yes	Yes	Yes	Yes	Yes	Yes
Switching capacity of the outputs						
• on lamp load, max.	2.5 W	5 W	5 W	10 W	5 W	5 W
Load resistance range						
• 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
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
Output delay with resistive load						
• "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						
• 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						
• 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)						
all mounting positions						
- up to 60 °C, max.	1 A	1 A	4 A	4 A	2 A	2 A
Cable length						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
Isochronous mode						
Isochronous operation (application synchronized up to terminal)	Yes	No	Yes	No	Yes	Yes
Interrupts/diagnostics/status information						
Substitute values connectable	Yes; 0/1		Yes; 0/1			
Diagnostic messages						
• 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	
Diagnostics indication LED						
• Group error SF (red)	Yes		Yes		Yes; SF-LED (red)	
• Status indicator digital output (green)	Yes	Yes	Yes	Yes	Yes; Per channel	Yes

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Digital electronic modules**Technical specifications (continued)**

Article number	6ES7132-4BB01-0AB0 ET200S, EL-MOD., 2DO HF,DC24V, 0.5A, 5PC	6ES7132-4BB01-0AA0 ET200S, EL-MOD., 2DO ST,DC24V, 0.5A, 5PC	6ES7132-4BB31-0AB0 ET200S, EL-MOD., 2DO HF, DC 24V, 2A, 5PC	6ES7132-4BB31-0AA0 ET200S, EL-MOD., 2DO ST, DC 24V, 2A, 5PC	6ES7132-4BD00-0AB0 ET200S, EL-MOD., 4DO HF,DC24V, 0.5A,5PCS	6ES7132-4BD02-0AA0 ET200S, EL-MOD., 4DO ST,DC24V, 0.5A,5PCS
Parameter						
Remark	3 byte	1 byte	3 byte	1 byte		1 byte
Diagnosis: wire break	Disable / enable		Disable / enable			
Diagnosis: 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			
Galvanic isolation						
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
Isolation						
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC
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
Weights						
Weight, approx.	40 g	40 g	40 g	40 g	40 g	40 g
Article number	6ES7132-4BF00-0AB0 ET200S, ELECTR.MODULE 8DO HF DC24V/0,5A			6ES7132-4BF00-0AA0 ET200S, ELEKTRONIC MODULE 8DO DC24V/0,5A		
Product type designation						
Supply voltage						
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		
Input current						
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		
Power losses						
Power loss, typ.				1.5 W		
Address area						
Address space per module						
• with packing	Not relevant					
• without packing	1 byte			1 byte		

Technical specifications (continued)

Article number	6ES7132-4BF00-0AB0 ET200S, ELECTR.MODULE 8DO HF DC24V/0,5A	6ES7132-4BF00-0AA0 ET200S, ELEKTRONIC MODULE 8DO DC24V/0,5A
Digital outputs		
Number of digital outputs	8	8
short-circuit protection	Yes	Yes
• Response threshold, typ.	0.7 to 1.9 A	o.k.
Limitation of inductive shutdown voltage to	L+ -(47 to 60 V)	o.k.
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	3 400 Ω	3 400 Ω
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
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)		
all mounting positions - up to 60 °C, max.		4 A
horizontal installation - up to 60 °C, max.	4 A	
vertical installation - up to 40 °C, max.	4 A; At 55 °C and 24 V DC	
Cable length		
• shielded, max.	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m
Isochronous mode		
Isochronous operation (application synchronized up to terminal)	Yes	Yes; jitter incumbered < 100us
Interrupts/diagnostics/status information		
Diagnostic messages		
• Diagnostic functions	Yes	No
• Short circuit	Yes; Module-wise	
Diagnostics indication LED		
• Group error SF (red)	Yes; SF-LED (red)	
• Status indicator digital output (green)	Yes; Per channel	Yes

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Digital electronic modules

Technical specifications (continued)

Article number	6ES7132-4BF00-0AB0 ET200S, ELECTR.MODULE 8DO HF DC24V/0,5A		6ES7132-4BF00-0AA0 ET200S, ELEKTRONIC MODULE 8DO DC24V/0,5A		
Parameter					
Remark	1 byte		3-byte parameter (not accessible for the user)		
Galvanic isolation					
Galvanic isolation digital outputs					
• between the channels	No		No		
• between the channels and the backplane bus	Yes		Yes		
Isolation					
Isolation checked with	500 V DC		500 V DC		
Dimensions					
Width	15 mm		15 mm		
Height	81 mm		81 mm		
Depth	52 mm		52 mm		
Weights					
Weight, approx.	40 g		40 g		
Article number	6ES7132-4BD30-0AB0 ET200S, EL-MOD., 4DO HF, DC24V, 2A, 5PCS	6ES7132-4BD32-0AA0 ET200S, EL-MOD., 4DO ST, DC24V, 2A, 5PCS	6ES7132-4FB01-0AB0 ET200S, ELECT. MOD., 2DO, AC 230V, 5PCS	6ES7132-4HB01-0AB0 ET200S, EL-MOD., 2RO, DC24VAC230V, 5A,5PCS	6ES7132-4HB12-0AB0 ET200S, EL-MOD., 2RO, DC48V/AC230V, 5A,5PCS
Product type designation					
Supply voltage					
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
• Reverse polarity protection	Yes; polarity reversal can lead to the digital outputs being connected through	Yes		Yes	Yes
Load voltage L1					
• permissible range, lower limit (AC)			24 V; From power module		
• permissible range, upper limit (AC)			230 V		
Input current					
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
Power losses					
Power loss, typ.	1.6 W	1.6 W	4 W	0.6 W	0.6 W
Address area					
Address space per module					
• with packing	4 bit	4 bit	2 bit	2 bit	2 bit
• without packing	1 byte	1 byte	1 byte	1 byte	1 byte

Technical specifications (continued)

Article number	6ES7132-4BD30-0AB0 ET200S, EL-MOD., 4DO HF, DC24V, 2A, 5PCS	6ES7132-4BD32-0AA0 ET200S, EL-MOD., 4DO ST, DC24V, 2A, 5PCS	6ES7132-4FB01-0AB0 ET200S, ELECT. MOD., 2DO, AC 230V, 5PCS	6ES7132-4HB01-0AB0 ET200S, EL-MOD., 2RO, DC24VAC230V, 5A,5PCS	6ES7132-4HB12-0AB0 ET200S, EL-MOD., 2RO,DC48V/AC230V, 5A,5PCS
Digital outputs					
Number of digital outputs	4	4	2	2	2
short-circuit protection	Yes	Yes	Yes	No	No
• Response threshold, typ.	5 to 10 A	2.8 to 7.2 A			
Limitation of inductive shutdown voltage to	L+ (-37 to 41V)	Typ. L+ (-55 to -60 V)	-55 to -60 V	No	No
Controlling a digital input	Yes	Yes	Yes; possible	Yes	Yes
Switching capacity of the outputs					
• on lamp load, max.		10 W	100 W		
Load resistance range					
• lower limit	12 Ω	12 Ω			
• upper limit	3 400 Ω	3 400 Ω			
Output voltage					
• for signal "1", min.	L+ (-1.0 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.	250 μs	50 μs; Typ. 45 μs	15 ms		
• "1" to "0", max.	400 μs	120 μs; Typ. 90 μs	15 ms		
Parallel switching of 2 outputs					
• for increased power	No	No	No		
• for redundant control of a load	Yes; per module	Yes; per module	Yes; per module		
Switching frequency					
• with resistive load, max.	100 Hz	1 000 Hz	10 Hz	2 Hz	2 Hz
• with inductive load, max.	2 Hz	2 Hz; At 0.5 H	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)					
all mounting positions					
- up to 40 °C, max.			2 A		
- up to 50 °C, max.			1.5 A		
- up to 60 °C, max.		4 A	1 A		
horizontal installation					
- up to 60 °C, max.	4 A				
vertical installation					
- up to 40 °C, max.	4 A; At 55 °C and 24 V DC	4 A; At 55 °C and 24 V DC			
Relay outputs					
Switching capacity of contacts					
- Thermal continuous current, max.				5 A	5 A
Cable length					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	Yes	Yes		No	No

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Digital electronic modules**Technical specifications** (continued)

Article number	6ES7132-4BD30-0AB0 ET200S, EL-MOD., 4DO HF, DC24V, 2A, 5PCS	6ES7132-4BD32-0AA0 ET200S, EL-MOD., 4DO ST, DC24V, 2A, 5PCS	6ES7132-4FB01-0AB0 ET200S, ELECT. MOD., 2DO, AC 230V, 5PCS	6ES7132-4HB01-0AB0 ET200S, EL-MOD., 2RO, DC24VAC230V, 5A,5PCS	6ES7132-4HB12-0AB0 ET200S, EL-MOD., 2RO, DC48V/AC230V, 5A,5PCS
Interrupts/diagnostics/ status information					
Substitute values connectable				Yes; 0/1	Yes; 0/1
Diagnostic messages					
• Diagnostic functions	Yes	No	No	No	No
• Short circuit	Yes; Module-wise				
Diagnostics indication LED					
• Group error SF (red)	Yes; SF-LED (red)				
• Status indicator digital output (green)	Yes; Per channel	Yes	Yes	Yes	Yes
Parameter					
Remark		1 byte	3 byte		
Behavior on CPU/Master STOP, channel-wise			Substitute a value/ keep last value, 0/1	Substitute a value/ keep last value	Substitute a value/ keep last value
Galvanic isolation					
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
Isolation					
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	1500 V AC
• Load voltage L+ against backplane bus				500 V DC	500 V DC
Extended ambient conditions					
• Relative to ambient temperature-atmospheric pressure-installation altitude				Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
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
Weights					
Weight, approx.	40 g	40 g	37 g	50 g	50 g

Technical specifications (continued)

Article number	6ES7132-4BF50-0AA0 ET200S, 8DO SINK OUTPUT DC24V/0,5A	6ES7132-4BD50-0AA0 ET200S,4DO SINK OUTPUT DC24V/0,5A , 5PCS	6ES7132-4HB50-0AB0 ET200S,2RO,DC48V/AC230V, MANUAL ACTUATION
Product type designation			
Supply voltage			
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 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
• Reverse polarity protection	Yes	Yes	Yes
Input current			
from load voltage L+ (without load), max.	5 mA	5 mA; Per channel	30 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA
Power losses			
Power loss, typ.	1.5 W	0.8 W	0.6 W
Address area			
Address space per module			
• with packing		4 bit	2 bit
• without packing	1 byte	1 byte	1 byte
Digital outputs			
Number of digital outputs	8	4	2
short-circuit protection	Yes	Yes	No
• Response threshold, typ.	1,5 A		
Limitation of inductive shutdown voltage to	Typ. 47 V		No
Controlling a digital input	Yes	Yes	Yes
Switching capacity of the outputs			
• on lamp load, max.	5 W	5 W	
Load resistance range			
• lower limit	48 Ω	48 Ω	
• upper limit	3 400 Ω	3 400 Ω	
Output voltage			
• for signal "1", min.	Max. 1 V	1 V	
Output current			
• for signal "1" rated value	0.5 A	0.5 A	5 A
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA	5 mA	
• for signal "1" permissible range for 0 to 60 °C, max.	700 mA	700 mA	
• for signal "1" minimum load current			8 mA
• for signal "0" residual current, max.	5 μA	5 μA	
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; per module	
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz	2 Hz
Aggregate current of outputs (per group)			
all mounting positions			
- up to 60 °C, max.	4 A	2 A	
Relay outputs			
Switching capacity of contacts			
- Thermal continuous current, max.			5 A
Cable length			
• shielded, max.	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Digital electronic modules**Technical specifications** (continued)

Article number	6ES7132-4BF50-0AA0 ET200S, 8DO SINK OUTPUT DC24V/0,5A	6ES7132-4BD50-0AA0 ET200S,4DO SINK OUTPUT DC24V/0,5A , 5PCS	6ES7132-4HB50-0AB0 ET200S,2RO,DC48V/AC230V, MANUAL ACTUATION
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	Yes	Yes	No
Interrupts/diagnostics/ status information			
Substitute values connectable			Yes; 0/1
Diagnostic messages			
• Diagnostic functions	No	No	No
Diagnostics indication LED			
• Status indicator digital output (green)	Yes	Yes	Yes
Parameter			
Remark	3 byte	1 byte	
Behavior on CPU/Master STOP, channel-wise			Substitute a value/keep last value
Galvanic isolation			
Galvanic isolation digital outputs			
• between the channels	No	No	Yes
• between the channels and the backplane bus	Yes	Yes	Yes
• between the channels and the load voltage L+			Yes
Isolation			
Isolation checked with	500 V DC	500 V DC	
tested with			
• Channels against backplane bus and load voltage L+			1500 V AC
• Load voltage L+ against backplane bus			500 V DC
Extended ambient conditions			
• Relative to ambient temperature-atmospheric pressure-installation altitude			Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Dimensions			
Width	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm
Weights			
Weight, approx.	40 g	40 g	50 g

Ordering data	Article No.	Article No.
Digital input modules		Accessories
Ordering unit 5 items		Label sheets DIN A4 (10 pieces)
• 2 DI 24 V DC Standard	6ES7131-4BB01-0AA0	Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules
• 2 DI 24 V DC High Feature	6ES7131-4BB01-0AB0	• petrol
• 4 DI 24 V DC Standard	6ES7131-4BD01-0AA0	• red
• 4 DI 24 V DC High Feature	6ES7131-4BD01-0AB0	• yellow
• 2 DI 120 V AC	6ES7131-4EB00-0AB0	• light beige
• 2 DI 230 V AC	6ES7131-4FB00-0AB0	
• 4 DI 24 to 48 V UC	6ES7131-4CD02-0AB0	
• 4 DI 24 V DC SOURCE INPUT	6ES7131-4BD51-0AA0	
Ordering unit 1 item		
• 4 DI 24 V DC NAMUR	6ES7131-4RD02-0AB0	
• 8 DI 24 V DC Standard	6ES7131-4BF00-0AA0	
• 8 DI, 24 V DC, Standard SOURCE INPUT	6ES7131-4BF50-0AA0	
Ordering unit 100 items		
• 8 DI 24 V DC Standard	6ES7131-4BF00-4AA0	
Digital output modules		
Ordering unit 5 items		
• 2 DO 24 V DC/0.5 A Standard	6ES7132-4BB01-0AA0	
• 2 DO 24 V DC/0.5 A High Feature	6ES7132-4BB01-0AB0	
• 2 DO 24 V DC/2 A Standard	6ES7132-4BB31-0AA0	
• 2 DO 24 V DC/2 A High Feature	6ES7132-4BB31-0AB0	
• 4 DO 24 V DC/0.5 A Standard	6ES7132-4BD02-0AA0	
• 4 DO, 24 V DC/0.5 A, Standard SOURCE OUTPUT	6ES7132-4BD50-0AA0	
• 4 DO 24 V DC/0.5 A High Feature	6ES7132-4BD00-0AB0	
• 8 DO 24 V DC/0.5 A High Feature	6ES7132-4BF00-0AB0	
• 4 DO 24 V DC/2 A Standard	6ES7132-4BD32-0AA0	
• 4 DO 24 V DC/2 A High Feature	6ES7132-4BD30-0AB0	
• 2 DO 24 to 230 V AC/2 A	6ES7132-4FB01-0AB0	
• 2 DO 24 V DC to 230 V AC/5 A relay, NO contact	6ES7132-4HB01-0AB0	
• 2 DO 24...48 V DC/5 A, 24...230 V AC/5 A relay, changeover contact	6ES7132-4HB12-0AB0	
Ordering unit 1 item		
• 2 DO 24...48 V DC/5 A, 24...230 V AC/5 A relay, changeover contact, with manual operation	6ES7132-4HB50-0AB0	
• 8 DO 24 V DC/0.5 A Standard	6ES7132-4BF00-0AA0	
• 8 DO, 24 V DC/0.5 A, Standard SINK OUTPUT	6ES7132-4BF50-0AA0	
Ordering unit 100 items		
• 8 DO 24 V DC/0.5 A Standard	6ES7132-4BF00-4AA0	

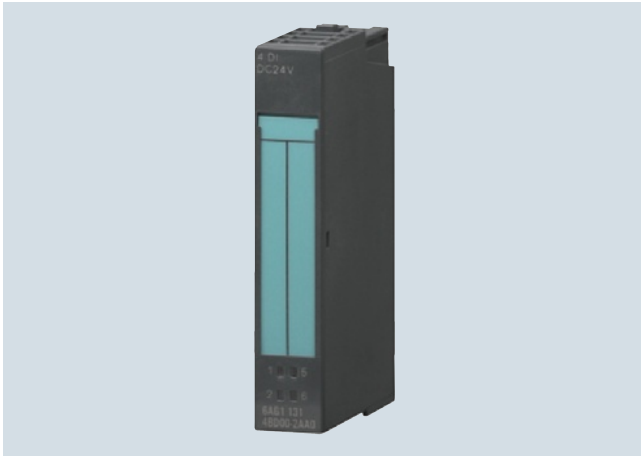
I/O systems

ET 200 systems for the control cabinet

ET 200S - 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For further technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1131-4BD01-2AA0	6AG1131-4BD01-7AB0	6AG1131-4BF00-7AA0	6AG1131-4BF50-7AA0
Based on	6ES7131-4BD01-0AA0 SIPLUS DP 4DI ET200S	6ES7131-4BD01-0AB0 SIPLUS ET200S EM 4 DI HIGH FEATURES	6ES7131-4BF00-0AA0 SIPLUS ET200S EM 8 DI	6ES7131-4BF50-0AA0 SIPLUS ET200S EM 8 DI DC24V
Ambient conditions				
Ambient temperature in operation				
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin
• max.	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
Extended ambient conditions				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)		Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity				
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Technical specifications (continued)

Article number	6AG1132-4BB01-2AB0	6AG1132-4BB31-7AB0	6AG1132-4BD02-7AA0	6AG1132-4BD32-2AA0
Based on	6ES7132-4BB01-0AB0 SIPLUS DP 2DO HF ET200S	6ES7132-4BB31-0AB0 SIPLUS ET200S 2DO HIGH FEATURE	6ES7132-4BD02-0AA0 SIPLUS ET200S 4DO (1VE = 5 STUECK)	6ES7132-4BD32-0AA0 SIPLUS_ET200S_4DO DC24V/2A
Ambient conditions				
Ambient temperature in operation				
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax
Extended ambient conditions				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

SIPLUS digital electronic modules**Technical specifications (continued)**

Article number	6AG1132-4BF00-7AA0	6AG1132-4BF50-7AA0	6AG1132-4HB01-2AB0	6AG1132-4HB12-2AB0
Based on	6ES7132-4BF00-0AA0 SIPLUS ET200S EM 8 DO	6ES7132-4BF50-0AA0 SIPLUS ET200S EM 8 DO DC24V/0.5A	6ES7132-4HB01-0AB0 SIPLUS ET200S 2DORLY 24-48VDC 230VAC/5A	6ES7132-4HB12-0AB0 SIPLUS ET200S 2DORLY 24-48VDC 230VAC/5A
Ambient conditions				
Ambient temperature in operation				
• Min.	-40 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax
Extended ambient conditions				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
Relative humidity				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data	Article No.	Accessories	Article No.
<p>SIPLUS digital input modules (extended temperature range and medial exposure)</p> <p>Ordering unit 5 units</p> <ul style="list-style-type: none"> • 4 DI 24 V DC Standard 6AG1131-4BD01-2AA0 • 4 DI 24 V DC High Feature 6AG1131-4BD01-7AB0 • 8 DI 24 V DC Standard 6AG1131-4BF00-7AA0 <p>Ordering unit 1 unit</p> <ul style="list-style-type: none"> • 8 DI 24 V DC Source Input 6AG1131-4BF50-7AA0 			See SIMATIC ET 200S digital electronic module, page 9/141
<p>SIPLUS digital output modules (extended temperature range and medial exposure)</p> <p>Ordering unit 5 units</p> <ul style="list-style-type: none"> • 2 DO 24 V DC/0.5 A High Feature 6AG1132-4BB01-2AB0 • 2 DO 24 V DC/2 A High Feature 6AG1132-4BB31-7AB0 • 4 DO 24 V DC/0.5 A Standard 6AG1132-4BD02-7AA0 • 4 DO 24 V DC/2 A Standard 6AG1132-4BD32-2AA0 • 2 DO 24 V DC to 230 V AC/5 A relay, NO contact 6AG1132-4HB01-2AB0 • 2 DO 24...48 V DC/5 A, 24...230 V AC/5 A relay, changeover contact 6AG1132-4HB12-2AB0 <p>Ordering unit 1 unit</p> <ul style="list-style-type: none"> • 8 DO 24 V DC/0.5 A Standard 6AG1132-4BF00-7AA0 • 8 DO, 24 V DC/0.5 A, Standard SOURCE OUTPUT 6AG1132-4BF50-7AA0 			

I/O systems

ET 200 systems for the control cabinet

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 variants with enhanced performance, precision and resolution
- High-speed variants with extremely fast, isochronous cycle times.
- Hot swapping of modules possible

Note:

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

Technical specifications

Article number	6ES7134-4FB01-0AB0	6ES7134-4LB02-0AB0	6ES7134-4GB01-0AB0	6ES7134-4GB52-0AB0
	ET200S, EL-MOD., 2AI STD U, +/-10V,1-5V	ET200S, EL-MOD., 2AI U HF, +/-10V, 1..5V	ET200S, EL-MOD., 2AI STD I-2DMU, 0-20MA,	ET200S, EL-MOD., 2AI HS I-2DMU, 0-20MA,
Product type designation				
Supply voltage				
Load voltage L+				
<ul style="list-style-type: none"> • Rated value (DC) • short-circuit protection • Reverse polarity protection 	24 V; From power module	24 V	24 V; From power module	24 V
	Yes	Yes	Yes; Destruction limit 35 mA per channel	Yes
Input current				
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
Output voltage				
Power supply to the transmitters				
<ul style="list-style-type: none"> • present • short-circuit proof 		No		Yes
				Yes
Power losses				
Power loss, typ.	0.6 W	0.85 W	0.6 W	2.5 W
Address area				
Address space per module				
<ul style="list-style-type: none"> • Address space per module, max. 	4 byte	4 byte	4 byte	4 byte
Analog inputs				
Number of analog inputs	2	2	2	2
permissible input voltage for voltage input (destruction limit), max.	35 V; 35 V continuous; 75 V for max. 1 ms (mark to space ratio 1:20)	35 V; 35 V continuous; 75 V for max. 1 ms		
permissible input current for current input (destruction limit), max.			40 mA	
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
Input ranges				
<ul style="list-style-type: none"> • Voltage • Current • Thermocouple • Resistance thermometer • Resistance 	Yes	Yes	No	No
	No	No	Yes	Yes
	No	No	No	No
	No	No	No	No
	No	No	No	No

Technical specifications (continued)

Article number	6ES7134-4FB01-0AB0 ET200S, EL-MOD., 2AI STD U, +/-10V,1-5V	6ES7134-4LB02-0AB0 ET200S, EL-MOD., 2AI U HF, +/-10V, 1..5V	6ES7134-4GB01-0AB0 ET200S, EL-MOD., 2AI STD I-2DMU, 0-20MA,	6ES7134-4GB52-0AB0 ET200S, EL-MOD., 2AI HS I-2DMU, 0-20MA,
Input ranges (rated values), voltages				
• 1 V to 5 V	Yes	Yes		
• Input resistance (1 V 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 mA to 20 mA			Yes; on 50 ohms	Yes
Cable length				
• shielded, max.	200 m	200 m	200 m	200 m
Analog value creation				
Measurement principle	integrating		integrating	
Integration and conversion time/ resolution per channel				
• Resolution with overrange (bit including sign), max.	14 bit; +/-10 V: 13 bits + sign, +/-5 V: 13 bits + sign; 1 to 5 V: 13 bits	16 bit; 0 to 5 V: 15 bits, +/-10 V: 16 bits, +/-5 V: 16 bits	13 bit; 4 to 20 mA: 13 bits	16 bit
• Integration time, parameterizable		Yes		
• Integration time (ms)	16,7 / 20 ms		16,7 / 20 ms	
• Interference voltage suppression for interference frequency f1 in Hz		60 / 50 Hz / no		
• 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	
Smoothing 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
Encoder				
Connection of signal encoders				
• for voltage measurement		Yes		
• for current measurement as 2-wire transducer - Burden of 2-wire transmitter, max.			750 Ω	Yes
Errors/accuracies				
Linearity error (relative to input range), (+/-)	0.01 %	0.01 %	0.01 %	0.03 %
Temperature error (relative to input range), (+/-)	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 steady state 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 %

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Analog electronic modules

Technical specifications (continued)

Article number	6ES7134-4FB01-0AB0 ET200S, EL-MOD., 2AI STD U, +/-10V,1-5V	6ES7134-4LB02-0AB0 ET200S, EL-MOD., 2AI U HF, +/-10V, 1..5V	6ES7134-4GB01-0AB0 ET200S, EL-MOD., 2AI STD I-2DMU, 0-20MA,	6ES7134-4GB52-0AB0 ET200S, EL-MOD., 2AI HS I-2DMU, 0-20MA,
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input area, (+/-)	0.4 %	0.05 %; 0.1% without interference frequency suppression	0.4 %	0.2 %
• Current, relative to input area, (+/-)				
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, $f_1 =$ 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.	90 dB	100 dB		
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	Yes	No	Yes
Interrupts/diagnostics/ status information				
Alarms				
• Hardware interrupt		Yes		Yes
Diagnostic messages				
• 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
Diagnostics indication LED				
• Group error SF (red)	Yes	Yes	Yes	Yes
Parameter				
Remark	4 byte	12 bytes, 4 bytes in compatibility mode	4 byte	
Diagnosis: 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
Galvanic isolation				
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
Permissible potential difference				
between the inputs (UCM)		140V DC/100V AC		
between inputs and MANA (UCM)	2 V AC PP			
between MANA and M internally (UISO)	75V DC/60V AC			75V DC/60V AC
Isolation				
Isolation checked with	500 V DC	500 V DC	500 V DC	
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
Weights				
Weight, approx.	40 g	45 g	40 g	

Technical specifications (continued)

Article number	6ES7134-4GB11-0AB0 ET200S, EL-MOD., 2AI STD I-4DMU, 0-20MA,	6ES7134-4MB02-0AB0 ET200S, EL-MOD., 2AI HF I, +/-20MA	6ES7134-4GD00-0AB0 ET200S, EL-MOD., 4AI STANDARD I 2-WIRE	6ES7134-4FB52-0AB0 ET200S, EL-MOD., 2AI HS U, +/-10V, 15BIT	6ES7134-4GB62-0AB0 ET200S, EL-MOD., 2AI HS I-4WIRE, 0-20MA
Product type designation					
Supply voltage					
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
Input current					
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
Output voltage					
Power supply to the transmitters					
• present		Yes	Yes		Yes
• short-circuit proof		Yes	Yes; approx. 200 mA for module		Yes
Encoder supply					
Number of outputs					2
Type of output voltage					24 V
short-circuit protection					Yes
Output current					
• nominal					80 mA; Per channel
• permissible range					0 to 90 mA
Power losses					
Power loss, typ.	0.6 W	1.2 W	0.6 W	1.9 W	1.9 W
Address area					
Address space per module					
• Address space per module, max.	4 byte	4 byte	8 byte	4 byte	4 byte
Analog inputs					
Number of analog inputs	2	2	4	2	2
permissible input voltage for voltage input (destruction limit), max.				35 V; Permanent	
permissible input current for current input (destruction limit), max.	40 mA	50 mA	30 mA; limited electronically		30 mA
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
Input ranges					
• 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

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Analog electronic modules

Technical specifications (continued)

Article number	6ES7134-4GB11-0AB0 ET200S, EL-MOD., 2AI STD I-4DMU, 0-20MA,	6ES7134-4MB02-0AB0 ET200S, EL-MOD., 2AI HF I, +/-20MA	6ES7134-4GD00-0AB0 ET200S, EL-MOD., 4AI STANDARD I 2-WIRE	6ES7134-4FB52-0AB0 ET200S, EL-MOD., 2AI HS U, +/-10V, 15BIT	6ES7134-4GB62-0AB0 ET200S, EL-MOD., 2AI HS I-4WIRE, 0-20MA
Input ranges (rated values), voltages					
• 1 V to 5 V				Yes	
• Input resistance (1 V 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 mA to +20 mA	Yes; 50 Ohm	Yes			Yes
• 4 mA to 20 mA	Yes; 50 Ohm	Yes	Yes; Into 25 Ohm		Yes
Cable length					
• shielded, max.	200 m	200 m	200 m	200 m	200 m
Analog value creation					
Measurement principle	integrating	Sigma Delta	integrating		
Integration and conversion time/ resolution per channel					
• Resolution with overrange (bit including sign), max.	14 bit; +/-20 mA: 14 bits, 4 to 20 mA: 13 bits	16 bit; as required	13 bit; 4 to 20 mA: 13 bits	16 bit; 15 bits: 1 to 5 V; +/-2.5 V; 16 bits: +/-10 V; +/-5 V	16 bit
• 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 / no			
• Conversion time (per channel)	65 ms; 55 / 65 ms	0.04 ms; Without noise suppression 17/20 ms per channel with error			
Smoothing 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
Encoder					
Connection of signal encoders					
• for voltage measurement				Yes	
• for current measurement as 2-wire transducer					No
- Burden of 2-wire transmitter, max.	750 Ω	750 Ω	750 Ω		

Technical specifications (continued)

Article number	6ES7134-4GB11-0AB0 ET200S, EL-MOD., 2AI STD I-4DMU, 0-20MA,	6ES7134-4MB02-0AB0 ET200S, EL-MOD., 2AI HF I, +/-20MA	6ES7134-4GD00-0AB0 ET200S, EL-MOD., 4AI STANDARD I 2-WIRE	6ES7134-4FB52-0AB0 ET200S, EL-MOD., 2AI HS U, +/-10V, 15BIT	6ES7134-4GB62-0AB0 ET200S, EL-MOD., 2AI HS I-4WIRE, 0-20MA
Errors/accuracies					
Linearity error (relative to input range), (+/-)	0.01 %	0.03 %	0.01 %	0.03 %	0.03 %
Temperature error (relative to input range), (+/-)	0.005 %/K	0.003 %/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 steady state 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 %
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 $f = n \times (f1 \pm 1 \%)$, $f1 =$ 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			
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	No	Yes	No	Yes	Yes
Interrupts/diagnostics/status information					
Alarms					
• Hardware interrupt		Yes		Yes	Yes
Diagnostic messages					
• 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; Measuring range 4 to 20 mA only
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• Group error SF (red)	Yes	Yes	Yes	Yes	Yes
Parameter					
Remark	4 byte	12 bytes, 4 bytes in compatibility mode	7 byte	12 bytes, 4 bytes in compatibility mode	
Diagnosis: 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

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Analog electronic modules**Technical specifications (continued)**

Article number	6ES7134-4GB11-0AB0 ET200S, EL-MOD., 2AI STD I-4DMU, 0-20MA,	6ES7134-4MB02-0AB0 ET200S, EL-MOD., 2AI HF I, +/-20MA	6ES7134-4GD00-0AB0 ET200S, EL-MOD., 4AI STANDARD I 2-WIRE	6ES7134-4FB52-0AB0 ET200S, EL-MOD., 2AI HS U, +/-10V, 15BIT	6ES7134-4GB62-0AB0 ET200S, EL-MOD., 2AI HS I-4WIRE, 0-20MA
Galvanic isolation					
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
Permissible potential difference					
between MANA and M internally (UISO)					75V DC/60V AC
Isolation					
Isolation checked with	500 V DC		500 V DC	500 V DC	
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
Weights					
Weight, approx.	40 g	45 g	40 g	45 g	45 g
Article number	6ES7134-4JB01-0AB0 ET200S, EL-MOD., 2AI TC, +/-80MV, 15BIT	6ES7134-4JB51-0AB0 ET200S, EL-MOD., 2/4 AI RTD STANDARD	6ES7134-4JD00-0AB0 ET200S, EL-MOD., 4AI TC, +/-80MV, 15BIT	6ES7134-4NB01-0AB0 ET200S, EL-MOD., 2AI TC HF, 15BIT	6ES7134-4NB51-0AB0 ET200S, EL-MOD., 2AI RTD HF, 15BIT
Product type designation					
Supply voltage					
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
Input current					
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
Output voltage					
Power supply to the transmitters					
• present		Yes			
• short-circuit proof		Yes			
Power losses					
Power loss, typ.	0.6 W	0.6 W	0.6 W	0.6 W	0.6 W
Address area					
Address space per module					
• Address space per module, max.	4 byte	8 byte	8 byte	4 byte	4 byte

Technical specifications (continued)

Article number	6ES7134-4JB01-0AB0 ET200S, EL-MOD., 2AI TC, +/-80MV, 15BIT	6ES7134-4JB51-0AB0 ET200S, EL-MOD., 2/4 AI RTD STANDARD	6ES7134-4JD00-0AB0 ET200S, EL-MOD., 4AI TC, +/-80MV, 15BIT	6ES7134-4NB01-0AB0 ET200S, EL-MOD., 2AI TC HF, 15BIT	6ES7134-4NB51-0AB0 ET200S, EL-MOD., 2AI RTD HF, 15BIT
Analog inputs					
Number of analog inputs	2	4; 2 for 3 or 4-wire connection	4	2	2
permissible input voltage for voltage input (destruction limit), max.	10 V; Permanent	9 V	10 V; Permanent	20 V; +/-20 V, continuous	9 V
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
Technical unit for temperature measurement adjustable	No	No	No	Yes	Yes
Input ranges					
• Voltage	Yes	No	Yes	Yes	No
• Current	No	No	No	No	No
• Thermocouple	Yes	No	Yes	Yes	No
• Resistance thermometer	No	Yes	No	No	Yes
• Resistance	No	Yes	No	No	Yes
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	

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Analog electronic modules

Technical specifications (continued)

Article number	6ES7134-4JB01-0AB0 ET200S, EL-MOD., 2AI TC, +/-80MV, 15BIT	6ES7134-4JB51-0AB0 ET200S, EL-MOD., 2/4 AI RTD STANDARD	6ES7134-4JD00-0AB0 ET200S, EL-MOD., 4AI TC, +/-80MV, 15BIT	6ES7134-4NB01-0AB0 ET200S, EL-MOD., 2AI TC HF, 15BIT	6ES7134-4NB51-0AB0 ET200S, EL-MOD., 2AI RTD HF, 15BIT
Input ranges (rated values), resistance thermometer					
• 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
• 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 ohms		Yes			Yes
• Input resistance (0 to 150 ohms)		2 000 kΩ			10 MΩ
• 0 to 300 ohms		Yes			Yes
• Input resistance (0 to 300 ohms)		2 000 kΩ			10 MΩ
• 0 to 600 ohms		Yes			Yes
• Input resistance (0 to 600 ohms)		2 000 kΩ			10 MΩ
• 0 to 3000 ohms					Yes
• Input resistance (0 to 3000 ohms)					10 MΩ
Thermocouple (TC)					
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	
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
Cable length					
• shielded, max.	50 m	200 m	50 m	50 m	200 m

Technical specifications (continued)

Article number	6ES7134-4JB01-0AB0 ET200S, EL-MOD., 2AI TC, +/-80MV, 15BIT	6ES7134-4JB51-0AB0 ET200S, EL-MOD., 2/4 AI RTD STANDARD	6ES7134-4JD00-0AB0 ET200S, EL-MOD., 4AI TC, +/-80MV, 15BIT	6ES7134-4NB01-0AB0 ET200S, EL-MOD., 2AI TC HF, 15BIT	6ES7134-4NB51-0AB0 ET200S, EL-MOD., 2AI RTD HF, 15BIT
Analog value creation					
Measurement principle	integrating	integrating	integrating	integrating	integrating (Sigma-Delta)
Integration and conversion time/ resolution per channel					
<ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. 	16 bit; 15 bits + sign	16 bit; 150 ohms: 14 bits; 300, 600 ohms: 15 bits, Pt100, Ni100: 16 bits	16 bit; 15 bits + sign	16 bit	16 bit; for Pt100, Ni100, Ni120, Pt200, Ni200, Pt 500, Ni 500, Pt1000, Ni1000, Cu10: 15 bits + sign; for 150, 300, 600, 3000 ohms: 15 bits; for PTC: 1 bits
<ul style="list-style-type: none"> Integration time, parameterizable Integration time (ms) Conversion time (per channel) 	Yes 16,7 / 20 ms 65 s; 55 / 65 ms (additional 20 ms on activated wire-break test)	Yes 16,7 / 20 ms 66 / 80 ms; additional conversion time for diagnostic wire break test	Yes 16,7 / 20 ms 65 ms; 55 / 65 ms (additional 20 ms on activated wire-break test)	Yes 16,7 / 20 ms 66 ms; 66 / 80 ms; additional conversion time for diagnostic wire break test	Yes 16,7 / 20 ms Basic conversion time incl. integration time: 50 / 60 ms; additional conversion time for diagnostics of wire break test: 5 / 5 ms; additional conversion time for line compen- sation with 3-wire connection: 50 / 60 ms
Smoothing of measured values					
<ul style="list-style-type: none"> Parameterizable Step: None Step: low Step: Medium Step: High 	Yes; In four stages by means of digital filtering Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; In four stages by means of digital filtering Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; In four stages by means of digital filtering Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; In four stages by means of digital filtering Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; In four stages by means of digital filtering Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time
Encoder					
Connection of signal encoders					
<ul style="list-style-type: none"> for voltage measurement for resistance measurement with two-wire connection for resistance measurement with three-wire connection for resistance measurement with four-wire connection 	Yes	Yes	Yes		Yes Yes; internal compen- sation of the line resis- tances Yes

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules

Analog electronic modules

Technical specifications (continued)

Article number	6ES7134-4JB01-0AB0 ET200S, EL-MOD., 2AI TC, +/-80MV, 15BIT	6ES7134-4JB51-0AB0 ET200S, EL-MOD., 2/4 AI RTD STANDARD	6ES7134-4JD00-0AB0 ET200S, EL-MOD., 4AI TC, +/-80MV, 15BIT	6ES7134-4NB01-0AB0 ET200S, EL-MOD., 2AI TC HF, 15BIT	6ES7134-4NB51-0AB0 ET200S, EL-MOD., 2AI RTD HF, 15BIT
Errors/accuracies					
Linearity error (relative to input range), (+/-)	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %
Temperature error (relative to input range), (+/-)	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 steady state at 25 °C (relative to input area), (+/-)	0.05 %	0.05 %	0.05 %	0.05 %	0.05 %
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 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 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 $f = n \times (f1 \pm 1 \%)$, $f1 = \text{interference frequency}$					
• 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

Technical specifications (continued)

Article number	6ES7134-4JB01-0AB0 ET200S, EL-MOD., 2AI TC, +/-80MV, 15BIT	6ES7134-4JB51-0AB0 ET200S, EL-MOD., 2/4 AI RTD STANDARD	6ES7134-4JD00-0AB0 ET200S, EL-MOD., 4AI TC, +/-80MV, 15BIT	6ES7134-4NB01-0AB0 ET200S, EL-MOD., 2AI TC HF, 15BIT	6ES7134-4NB51-0AB0 ET200S, EL-MOD., 2AI RTD HF, 15BIT
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	No	No	No		No
Diagnostic messages					
• Diagnostic functions	Yes; Can be read out	Yes; Can be read out	Yes; Can be read out		
• Diagnostic information readable	Yes		Yes		
• Wire break	Yes; A break in the wire is only detected for thermocouples	Yes	Yes; A break in the wire is only detected for thermocouples	Yes; only thermo-couples	Yes
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• Group error SF (red)	Yes	Yes	Yes	Yes	Yes
Parameter					
Remark	4 byte		4 byte	4 byte	7 byte
Diagnosis: 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
Measurement type/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 ohms/; 300 ohms/ 600 ohms/ Pt100 climatic/ Pt100 standard; Ni100 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 number	None / 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8		None / 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8		
Unit	Celsius		Celsius	Celsius / Fahrenheit	
Galvanic isolation					
Galvanic isolation analog 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	Yes	Yes	Yes	Yes
Permissible potential difference					
between inputs and MANA (UCM)	2 V AC PP		2 V AC PP	140V DC/100V AC	
between MANA and M internally (UISO)	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
Isolation					
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC
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
Weights					
Weight, approx.	40 g	40 g	40 g	40 g	40 g

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Analog electronic modules**Technical specifications (continued)**

Article number	6ES7135-4FB01-0AB0 ET200S, EL-MOD., 2AO U, +/-10V, 1-5V	6ES7135-4FB52-0AB0 ET200S, EL-MOD., 2AO U, +/-10V, 1-5V	6ES7135-4LB02-0AB0 ET200S, EL-MOD., 2AO HF U, +/-10V, 1-5V
Product type designation			
Supply voltage			
Load voltage L+			
• Rated value (DC)	24 V; From power module	24 V; From power module	24 V
• Reverse polarity protection	Yes	Yes	Yes
Input current			
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
Power losses			
Power loss, max.	2 W	2 W	1.2 W
Address area			
Address space per module			
• Address space per module, max.	4 byte	4 byte	4 byte
Analog outputs			
Number of analog outputs	2	2	2
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 V to 5 V	Yes	Yes	Yes; -5 to +5 V also implemented
• -10 V to +10 V	Yes	Yes; +/-5V as well	Yes
Connection of actuators			
• for voltage output two-wire connection	Yes; Without compensation of the line resistances	Yes; Without compensation of the line resistances	Yes
• for voltage output four-wire 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; 0.1 µF for Twa=0.1 ms	0.5 µF
Destruction limits against externally applied voltages and currents			
• Voltages at the outputs towards MANA	15 V; max. 15 V continuous; 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	
Cable length			
• shielded, max.	200 m	200 m; Max. 20 m for TWA 100 µs	200 m; 100m if Twa < 2ms

Technical specifications (continued)

Article number	6ES7135-4FB01-0AB0 ET200S, EL-MOD., 2AO U, +/-10V, 1-5V	6ES7135-4FB52-0AB0 ET200S, EL-MOD., 2AO U, +/-10V, 1-5V	6ES7135-4LB02-0AB0 ET200S, EL-MOD., 2AO HF U, +/-10V, 1-5V
Analog value creation			
Integration and conversion time/ resolution per channel			
• Resolution with overrange (bit including sign), max.	14 bit; 1 to 5 V: 12 bits, +/-10 V: 13 bits + sign	16 bit; 1 to 5 V: 14 bits, +/-10 V: 15 bit + sign, +/-5 V: 14 bits + sign	16 bit; 15 bits + 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. 0.5 µF
• for inductive load	0.5 ms	0.05 ms	0.5 ms
Errors/accuracies			
Output ripple (based on output area, bandwidth 0 to 50 kHz), (+/-)	0.02 %	0.02 %	0.02 %
Linearity error (relative to output range), (+/-)	0.02 %	0.03 %	0.01 %
Temperature error (relative to output range), (+/-)	0.01 %/K	0.01 %/K	
Crosstalk between the outputs, min.		60 dB	60 dB
Repeat accuracy in steady state 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 %
Isochronous mode			
Isochronous operation (application synchronized up to terminal)		Yes	Yes
Interrupts/diagnostics/ status information			
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
Diagnostic messages			
• Diagnostic functions		Yes	
• Diagnostic information readable		Yes	Yes
• Wire break		No	
• Short circuit	Yes	Yes	Yes
• Group error	Yes	Yes	Yes
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
Parameter			
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
Diagnosis: 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

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Analog electronic modules

Technical specifications (continued)

Article number	6ES7135-4FB01-0AB0 ET200S, EL-MOD., 2AO U, +/-10V, 1-5V	6ES7135-4FB52-0AB0 ET200S, EL-MOD., 2AO U, +/-10V, 1-5V	6ES7135-4LB02-0AB0 ET200S, EL-MOD., 2AO HF U, +/-10V, 1-5V
Galvanic isolation			
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
Permissible potential difference			
between MANA and M internally (UISO)	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
Isolation			
Isolation checked with			500 V DC
Dimensions			
Width	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm
Weights			
Weight, approx.	40 g	40 g	40 g
Article number	6ES7135-4GB01-0AB0 ET200S, EL-MOD., 2AO I, +/-20MA, 4-20MA	6ES7135-4MB02-0AB0 ET200S, EL-MOD., 2AO I HF, +/-20MA, 4-20MA	6ES7135-4GB52-0AB0 ET200S, EL-MOD., 2AO I, +/-20MA, 4-20MA
Product type designation			
Supply voltage			
Load voltage L+			
• Rated value (DC)	24 V; From power module	24 V	24 V
• Reverse polarity protection	Yes	Yes	Yes
Input current			
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
Power losses			
Power loss, max.	2 W	1.2 W	2.4 W; Typical
Address area			
Address space per module			
• Address space per module, max.	4 byte	4 byte	4 byte
Analog outputs			
Number of analog outputs	2	2	2
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 mA to +20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
Connection of actuators			
• for current output two-wire connection	Yes	Yes	Yes
• for current output four-wire 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 continuous; 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)
Cable length			
• shielded, max.	200 m	200 m; 100m if Twa < 2ms	200 m; Max. 20 m for TWA 100 µs

Technical specifications (continued)

Article number	6ES7135-4GB01-0AB0 ET200S, EL-MOD., 2AO I, +/-20mA, 4-20MA	6ES7135-4MB02-0AB0 ET200S, EL-MOD., 2AO I HF, +/-20mA, 4-20MA	6ES7135-4GB52-0AB0 ET200S, EL-MOD., 2AO I, +/-20mA, 4-20MA
Analog value creation			
Integration and conversion time/ resolution per channel			
• Resolution with overrange (bit including sign), max.	14 bit; 4 to 20 mA: 13 bits, +/-20 mA: 14 bits	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 ohms/100 nF and a max. cable length of 20 m
• for inductive load	0.5 ms	0.5 ms	0.05 ms
Errors/accuracies			
Output ripple (based on output area, bandwidth 0 to 50 kHz), (+/-)	0.02 %	0.02 %	0.02 %
Linearity error (relative to output range), (+/-)	0.02 %	0.01 %	0.03 %; with resistive load
Temperature error (relative to output range), (+/-)	0.01 %/K	0.003 %/K	0.01 %/K
Crosstalk between the outputs, min.		60 dB	-60 dB
Repeat accuracy in steady state 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 to loads from 200 to 350 Ohm, deviating opera- tional 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 ohms, deviating basic error limits for loads up to 200 ohms and from 350 to 500 ohms with up to 0.3%
Isochronous mode			
Isochronous operation (application synchronized up to terminal)		Yes	Yes
Interrupts/diagnostics/ status information			
Substitute values connectable	Yes; 0 to 65535 (range of values must be within the rated range)	Yes	Yes
Diagnostic messages			
• Diagnostic functions			Yes
• Diagnostic information readable		Yes	Yes
• Wire break	Yes	Yes	Yes
• Group error	Yes	Yes	Yes
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Analog electronic modules**Technical specifications** (continued)

Article number	6ES7135-4GB01-0AB0 ET200S, EL-MOD., 2AO I, +/-20MA, 4-20MA	6ES7135-4MB02-0AB0 ET200S, EL-MOD., 2AO I HF, +/-20MA, 4-20MA	6ES7135-4GB52-0AB0 ET200S, EL-MOD., 2AO I, +/-20MA, 4-20MA
Parameter			
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
Diagnosis: wire break	Disable / enable	Disable / enable	Disable / enable
Interference frequency suppression		Disable / enable	Disable / enable
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
Ex(i) characteristics			
Max. values of output circuits (per channel)			
• U _o (output no-load voltage), max.	18 V		
Galvanic isolation			
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
Permissible potential difference			
between MANA and M internally (UISO)	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
Isolation			
Isolation checked with		500 V DC	500 V DC
Dimensions			
Width	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm
Weights			
Weight, approx.	40 g	40 g	45 g

Ordering data	Article No.	Article No.
Analog input modules Ordering unit 1 item <ul style="list-style-type: none"> • 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 bits + 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 	6ES7134-4FB52-0AB0 6ES7134-4FB01-0AB0 6ES7134-4LB02-0AB0 6ES7134-4GB01-0AB0 6ES7134-4GB52-0AB0 6ES7134-4GB62-0AB0 6ES7134-4GB11-0AB0 6ES7134-4MB02-0AB0 6ES7134-4JB51-0AB0 6ES7134-4JB01-0AB0 6ES7134-4NB51-0AB0 6ES7134-4NB01-0AB0 6ES7134-4GD00-0AB0 6ES7134-4JD00-0AB0	Accessories for labeling Label sheets DIN A4 (10 pieces) Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules <ul style="list-style-type: none"> • petrol • red • yellow • light beige
		6ES7193-4BH00-0AA0 6ES7193-4BD00-0AA0 6ES7193-4BB00-0AA0 6ES7193-4BA00-0AA0
		Accessories for system-integrated shield connection Shield connection element Ordering unit 5 items For plugging into TM-E and TM-P
		6ES7193-4GA00-0AA0
		Shield clamps Ordering unit 5 items For 3 × 10 mm busbars
		6ES7193-4GB00-0AA0
		Grounding terminal Ordering unit 1 item For cable cross-sections up to 25 mm ²
		8WA2868
		3 × 10 mm busbars Ordering unit 1 item
		8WA2842
Analog output modules Ordering unit 1 item <ul style="list-style-type: none"> • 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 	6ES7135-4FB01-0AB0 6ES7135-4FB52-0AB0 6ES7135-4LB02-0AB0 6ES7135-4GB01-0AB0 6ES7135-4GB52-0AB0 6ES7135-4MB02-0AB0	

I/O systems

ET 200 systems for the control cabinet
ET 200S - 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 variants 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 SIMATIC 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 U Standard
Article number	6AG1134-4FB01-2AB0
BasedOn Article No.	6ES7134-4FB01-0AB0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

	SIPLUS analog electronic module 2 AI I Standard 2-wire
Article No.	6AG1134-4GB01-2AB0
BasedOn Article No.	6ES7134-4GB01-0AB0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

	SIPLUS analog electronic module 2 AI I Standard 4-wire
Article No.	6AG1134-4GB11-2AB0
BasedOn Article No.	6ES7134-4GB11-0AB0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

	SIPLUS analog electronic module 2 AI I High Feature
Article No.	6AG1134-4MB02-2AB0
BasedOn Article No.	6ES7134-4MB02-0AB0
Ambient temperature range	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

	SIPLUS analog electronic module 2 AI High Speed
Article No.	6AG1134-4GB52-2AB0
BasedOn Article No.	6ES7134-4GB52-0AB0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

	SIPLUS analog electronic module 4 AI I Standard 2-wire
Article No.	6AG1134-4GD00-2AB0
BasedOn Article No.	6ES7134-4GD00-0AB0
Ambient temperature range	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

	SIPLUS analog electronic module 2 AI RTD
Article No.	6AG1134-4JB51-7AB0
BasedOn Article No.	6ES7134-4JB51-0AB0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

	SIPLUS analog electronic module 2 AI RTD High Feature
Article No.	6AG1134-4NB51-2AB0
BasedOn Article No.	6ES7134-4NB51-0AB0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

Overview (continued)

SIPLUS analog electronic module 2 AI TC High Feature	
Article No.	6AG1134-4NB01-7AB0
BasedOn Article No.	6ES7134-4NB01-0AB0
Ambient temperature range	0 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS analog electronic module 2 AO U Standard	
Article No.	6AG1135-4FB01-2AB0
BasedOn Article No.	6ES7135-4FB01-0AB0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS analog electronic module 2 AO U High Feature	
Article No.	6AG1135-4LB02-7AB0
BasedOn Article No.	6ES7135-4LB02-0AB0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS analog electronic module 2 AO I Standard	
Article No.	6AG1135-4GB01-2AB0
BasedOn Article No.	6ES7135-4GB01-0AB0
Ambient temperature range	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For further technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

SIPLUS analog electronic modules

Technical specifications

Article number	6AG1134-4FB01-2AB0	6AG1134-4GB01-2AB0	6AG1134-4GB11-2AB0	6AG1134-4GB52-2AB0
	SIPLUS ET200S 2AI STANDARD U	SIPLUS_ET200S 2AI I/2 WIRE STANDARD	SIPLUS_ET200S_2AI	SIPLUS ET200S 2AI HIGH SPEED
Ambient conditions				
Ambient temperature in operation				
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
Extended ambient conditions				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity				
- With condensation, max.	100 %; incl. condensation / frost permitted (no commis- sioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commis- sioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commis- sioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commis- sioning under condensation conditions)
Resistance				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused inter- faces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused inter- faces during operation!

Technical specifications (continued)

Article number	6AG1134-4GD00-2AB0 SIPLUS_ET200S 4 AI I 2WIRE	6AG1134-4JB51-7AB0 SIPLUS_ET200S 2AI RTD	6AG1134-4MB02-2AB0 SIPLUS_ET200S EM 2 AE I HF	6AG1134-4NB01-7AB0 SIPLUS_ET200S 2 AI TC HF	6AG1134-4NB51-2AB0 SIPLUS_ET200S 2 AI RTD HF
Ambient conditions					
Ambient temperature in operation					
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	0 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax
Extended ambient conditions					
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity					
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance					
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules

SIPLUS analog electronic modules**Technical specifications (continued)**

Article number	6AG1135-4FB01-2AB0 SIPLUS ET200S EM 2AO U	6AG1135-4GB01-2AB0 SIPLUS_ET200S 2AO I STANDARD	6AG1135-4LB02-7AB0 SIPLUS ET200S 2AO U HIGH FEATURE
Ambient conditions			
Ambient temperature in operation			
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax
Extended ambient conditions			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity			
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data**Article No.****Article No.****SIPLUS analog input modules**

(extended temperature range and medial exposure)

- 2 AI U Standard
- 2 AI I Standard 2-wire
- 2 AI I Standard 4-wire
- 2 AI I High Feature 2-wire/4-wire (15 bits + sign)
- 2 AI High Speed 2-wire
- 4 AI Standard 2-wire
- 2 AI RTD Standard
- 2 AI RTD High Feature
- 2 AI TC High Feature

6AG1134-4FB01-2AB0
6AG1134-4GB01-2AB0
6AG1134-4GB11-2AB0
6AG1134-4MB02-2AB0

6AG1134-4GB52-2AB0
6AG1134-4GD00-2AB0
6AG1134-4JB51-7AB0
6AG1134-4NB51-2AB0
6AG1134-4NB01-7AB0

SIPLUS analog output modules

- 2 AO U Standard
- 2 AO U High Feature
- 2 AO I Standard

6AG1135-4FB01-2AB0
6AG1135-4LB02-7AB0
6AG1135-4GB01-2AB0

Accessories

See SIMATIC ET 200S analog electronics modules, page 9/163

Overview



- 1-channel module for connecting SSI sensors to the ET 200S
- For position detection 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 <http://www.siemens.com/simatic-technology>)

Technical specifications

Article number	6ES7138-4DB03-0AB0
	ET200S, EL-MOD., 1SSI 25BIT/1MHZ
Product type designation	
Supply voltage	
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
Input current	
from load voltage L+ (without load), max.	40 mA
Encoder supply	
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
• Type of output voltage	L+ (-0.8 V)
• Output current, max.	500 mA
• short-circuit protection	Yes
Power losses	
Power loss, typ.	1 W
Hardware configuration	
Module exchange	
• Hot swapping the IM-DP	Yes
• Module exchange under process voltage	Yes
Digital inputs	
Number of digital inputs	1
Input voltage	
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
Cable length	
• shielded, max.	50 m

Article number	6ES7138-4DB03-0AB0
	ET200S, EL-MOD., 1SSI 25BIT/1MHZ
Encoder	
Number of connectable encoders, max.	1
Connectable encoders	
• Absolute encoder (SSI)	Yes
Encoder signals, absolute encoder (SSI)	
• Message frame length, parameterizable	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
Diagnostics 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
Galvanic isolation	
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
Dimensions	
Width	15 mm
Height	81 mm
Depth	52 mm
Weights	
Weight, approx.	40 g

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules - Technology modules

SSI module

Ordering data	Article No.		Article No.
SSI module For connecting absolute encoders with an SSI interface	6ES7138-4DB03-0AB0	Accessories Label sheets DIN A4 (10 pieces) Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules <ul style="list-style-type: none"> • petrol • red • yellow • light beige Signal cable Preassembled for SSI absolute encoder 6FX2001-5, without D-Sub connector, UL/DESINA. For length code, see page 5/142.	6ES7193-4BH00-0AA0 6ES7193-4BD00-0AA0 6ES7193-4BB00-0AA0 6ES7193-4BA00-0AA0 6FX5002-2CC12-....

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

Article number	6ES7138-4DD01-0AB0 ET200S, EL-MOD., 2 PULSE
Product type designation	
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V; From power module
• Reverse polarity protection	Yes
Input current	
from load voltage L+ (without load), max.	40 mA
from backplane bus 3.3 V DC, max.	10 mA
Encoder supply	
Type of output voltage	L+ (-0.8 V)
short-circuit protection	Yes
Output current	
• nominal	500 mA
Power losses	
Power loss, typ.	1.8 W
Digital inputs	
Number of digital inputs	2
Input characteristic curve in accordance with IEC 61131, type 2	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
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
Cable length	
• shielded, max.	100 m

Article number	6ES7138-4DD01-0AB0 ET200S, EL-MOD., 2 PULSE
Digital outputs	
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)
Accuracy of pulse duration	+/- (time period x 100 ppm), +/-100 µs with a load <= 50 ohms
minimum pulse duration	100 µs
Controlling a digital input	Yes
Switching capacity of the outputs	
• on lamp load, max.	10 W
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	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	2 mA

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules - Technology modules

2 PULSE pulse generator

Technical specifications (continued)

Article number	6ES7138-4DD01-0AB0 ET200S, EL-MOD., 2 PULSE
Interrupts/diagnostics/ status information	
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes
• Status indicator digital input (green)	Yes
Pulse generator	
Number of channels	2; 1 digital input and 1 digital output per channel
Galvanic isolation	
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

Article number	6ES7138-4DD01-0AB0 ET200S, EL-MOD., 2 PULSE
Permissible potential difference between different circuits	75V DC/60V AC
Isolation	
Isolation checked with	500 V DC
Dimensions	
Width	15 mm
Height	81 mm
Depth	52 mm
Weights	
Weight, approx.	40 g

Ordering data

2 PULSE pulse generator and timer module
For ET 200S

Article No.

6ES7138-4DD01-0AB0

Article No.

Accessories

Label sheets DIN A4 (10 pieces)

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

- petrol
- red
- yellow
- light beige

6ES7193-4BH00-0AA0
6ES7193-4BD00-0AA0
6ES7193-4BB00-0AA0
6ES7193-4BA00-0AA0

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
- Precision-timed switching signals to 24 V DC output
- Measurement of output current
- Isochronous mode

Note:

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

SIPLUS pulse generator and timer module 2PULSE	
Article No.	6AG1138-4DD01-7AB0
Article No. based on	6ES7138-4DD01-0AB0
Ambient temperature range	-25 ... +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical specifications of the standard product apply except for the ambient conditions.
Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Ordering data	Article No.
SIPLUS 2 PULSE pulse generator and timer module	6AG1138-4DD01-7AB0
for 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	6ES7193-4BH00-0AA0
• red	6ES7193-4BD00-0AA0
• yellow	6ES7193-4BB00-0AA0
• light beige	6ES7193-4BA00-0AA0

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules - 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

Technical specifications

Article number	6ES7138-4DC01-0AB0 ET200S, EL-MOD., 1 STEP 5V/204KHZ
Product type designation	
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
Power losses	
Power loss, typ.	1.5 W
Digital inputs	
Number of digital inputs	2
Functions	Reference cams, pulse suppression, external stop, limit switch
Repeat frequency, max.	100 Hz
Input characteristic curve in accordance with IEC 61131, type 2	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V (-15% / +20%)
• for signal "1"	+11 to +30V
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	
• shielded, max.	1 000 m
• Unshielded, max.	600 m

Article number	6ES7138-4DC01-0AB0 ET200S, EL-MOD., 1 STEP 5V/204KHZ
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
Interrupts/diagnostics/ status information	
Diagnostics 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
Drive technology	
Cable length, max.	100 m; twisted and shielded in pairs
Step-by-step controllers	
Connection for stepper motors	Differential signals for pulses (PULSE, notPULSE) and direction (DIR, notDIR) to RS422
Number of stepper motor channels	1
Dimensions	
Width	15 mm
Height	81 mm
Depth	52 mm
Weights	
Weight, approx.	40 g

Ordering data	Article No.	Accessories	Article No.
1STEP stepper module for simple positioning tasks with stepper motor axes	6ES7138-4DC01-0AB0	Label sheets DIN A4 (10 pieces) Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules <ul style="list-style-type: none"> • petrol • red • yellow • light beige 	6ES7193-4BH00-0AA0 6ES7193-4BD00-0AA0 6ES7193-4BB00-0AA0 6ES7193-4BA00-0AA0

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules - Technology modules

1 POS U positioning module

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

Article number	6ES7138-4DL00-0AB0 ET200S, EL-MOD., 1 POS U, INC./SSI-ENC.
Product type designation	
Supply voltage	
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
Input current	
from load voltage L+ (without load), max.	55 mA
from backplane bus 3.3 V DC, max.	10 mA
Encoder supply	
5 V encoder supply	
• 5 V	No
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
• Type of output voltage	L+ (-0.8 V)
• Output current, max.	500 mA
• short-circuit protection	Yes
Power losses	
Power loss, typ.	2 W

Article number	6ES7138-4DL00-0AB0 ET200S, EL-MOD., 1 POS U, INC./SSI-ENC.
Digital inputs	
Input characteristic curve in accordance with IEC 61131, type 2	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
Cable length	
• Unshielded, max.	50 m
Digital outputs	
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)
Controlling a digital input	Yes
Switching capacity of the outputs	
• on lamp load, max.	5 W
Output voltage	
• Rated value (DC)	24 V
• for signal "0", max.	3 V
• for signal "1", min.	L+ (-1 V)
Output current	
• 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

Technical specifications (continued)

Article number	6ES7138-4DL00-0AB0 ET200S, EL-MOD., 1 POS U, INC./SSI-ENC.
Output delay with resistive load	
• "0" to "1", max.	typically 150 µs
• "1" to "0", max.	typically 150 µs
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	2 Hz
• on lamp load, max.	10 Hz
Cable length	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
Encoder	
Number of connectable encoders, max.	1
Connectable encoders	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes; Type 2
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

Article number	6ES7138-4DL00-0AB0 ET200S, EL-MOD., 1 POS U, INC./SSI-ENC.
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
• Monoflop time	64 µs
Updating the encoder value	
- Telegram runtime at 13 bit, min.	7 µs
- Telegram runtime at 25 bit, min.	13 µs
Response times	
Update time 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
Interrupts/diagnostics/status information	
Diagnostics 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
Galvanic isolation	
between backplane bus and all other circuit components	Yes
between the channels and backplane bus	Yes
Dimensions	
Width	30 mm
Height	81 mm
Depth	52 mm
Weights	
Weight, approx.	65 g

Ordering data

Article No.

1 POS U positioning module

6ES7138-4DL00-0AB0

Single-channel positioning module for ET 200S for positioning of operating and positioning axes

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules - Technology modules

1 COUNT 24 V/100 kHz counter module

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 now 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

Article number	6ES7138-4DA04-0AB0 ET200S, EL-MOD., COUNTER 100KHZ, 24V DC
Product type designation	
Supply voltage	
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
Input current	
from load voltage L+ (without load), max.	42 mA
from backplane bus 3.3 V DC, max.	10 mA
Encoder supply	
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	500 mA
Power losses	
Power loss, typ.	1 W
Hardware configuration	
Module exchange	
• Hot swapping the IM-DP	Yes
• Module exchange under process voltage	Yes

Article number	6ES7138-4DA04-0AB0 ET200S, EL-MOD., COUNTER 100KHZ, 24V DC
Digital inputs	
Number of digital inputs	1
Functions	Gate control, synchronization, latch function
Input characteristic curve in accordance with IEC 61131, type 2	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
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.	2.5 µs; Filter off: 2.5 µs (200 kHz), filter on: 25 µs (20 kHz)
Cable length	
• shielded, max.	100 m; Filter 20 kHz: 100 m, filter 200 kHz: 50 m

Technical specifications (continued)

Article number	6ES7138-4DA04-0AB0 ET200S, EL-MOD., COUNTER 100KHZ, 24V DC
Digital outputs	
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)
Controlling a digital input	Yes
Switching capacity of the outputs	
• on lamp load, max.	5 W
Output voltage	
• Rated value (DC)	24 V
• for signal "0", 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	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
Encoder	
Number of connectable encoders, max.	1
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes

Article number	6ES7138-4DA04-0AB0 ET200S, EL-MOD., COUNTER 100KHZ, 24V DC
Interrupts/diagnostics/ status information	
Diagnostic messages	
• Diagnostic functions	Yes
Diagnostics 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
Integrated Functions	
Measuring functions	
Measuring range	
- Frequency measurement, min.	0.1 Hz
- Frequency measurement, max.	100 kHz
- Period measurement, min.	10 µs
- Period measurement, max.	120 s
- Velocity measurement, min.	1 1/min
- Velocity measurement, max.	25 000 1/min
Counter	
Number of counter inputs	1; 32 Bit
Minimum pulse width	2.5 µs; Filter off: 2.5 µs (200 kHz), filter on: 25 µs (20 kHz)
Parameter	
Remark	16 byte
Galvanic isolation	
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
Dimensions	
Width	15 mm
Height	81 mm
Depth	52 mm
Weights	
Weight, approx.	40 g

I/O systems

ET 200 systems for the control cabinet
 ET 200S - I/O modules - Technology modules

1 COUNT 24 V/100 kHz counter module

Ordering data	Article No.	Article No.
1 COUNT 24 V/100 kHz counter module	6ES7138-4DA04-0AB0	
For universal counting and measuring tasks with ET 200S		
Accessories		
Label sheets DIN A4 (10 pieces)		
Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules		
<ul style="list-style-type: none"> • petrol • red • yellow • light beige 	6ES7193-4BH00-0AA0 6ES7193-4BD00-0AA0 6ES7193-4BB00-0AA0 6ES7193-4BA00-0AA0	
Shield connection element	6ES7193-4GA00-0AA0	
For TM-P and TM-E terminal modules, as fixing for busbars 3 x 10 mm, 5 items		
Shield clamps	6ES7193-4GB00-0AA0	
For connecting braided cable shields to the busbar, 5 items		
		SIMODRIVE sensor incremental encoder
		Externally mounted encoder, optical, incremental with HTL level, operating voltage 10 to 30 V
		<ul style="list-style-type: none"> • With synchronous flange, universal axial/radial cable outlet with connector <ul style="list-style-type: none"> - 100 pulses/revolution - 500 pulses/revolution - 1000 pulses/revolution - 2500 pulses/revolution • With synchronous flange, radial flange outlet <ul style="list-style-type: none"> - 100 pulses/revolution - 500 pulses/revolution - 1000 pulses/revolution - 2500 pulses/revolution • With synchronous flange, axial flange outlet <ul style="list-style-type: none"> - 100 pulses/revolution - 500 pulses/revolution - 1000 pulses/revolution - 2500 pulses/revolution • With clamping flange, universal axial/radial cable outlet with connector <ul style="list-style-type: none"> - 100 pulses/revolution - 500 pulses/revolution - 1000 pulses/revolution - 2500 pulses/revolution • With clamping flange, radial flange outlet <ul style="list-style-type: none"> - 100 pulses/revolution - 500 pulses/revolution - 1000 pulses/revolution - 2500 pulses/revolution • With clamping flange, axial flange outlet <ul style="list-style-type: none"> - 100 pulses/revolution - 500 pulses/revolution - 1000 pulses/revolution - 2500 pulses/revolution
		6FX2001-4DA10 6FX2001-4DA50 6FX2001-4DB00 6FX2001-4DC50 6FX2001-4FA10 6FX2001-4FA50 6FX2001-4FB00 6FX2001-4FC50 6FX2001-4HA10 6FX2001-4HA50 6FX2001-4HB00 6FX2001-4HC50 6FX2001-4NA10 6FX2001-4NA50 6FX2001-4NB00 6FX2001-4NC50 6FX2001-4QA10 6FX2001-4QA50 6FX2001-4QB00 6FX2001-4QC50 6FX2001-4SA10 6FX2001-4SA50 6FX2001-4SB00 6FX2001-4SC50
		Signal cable
		Preassembled for HTL and TTL encoder, without Sub-D connector, UL/DESINA. For length code, see page 5/142.
		6FX5002-2CA12-....

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:

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

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

For further technical documentation on SIPLUS, see: <http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1138-4DA04-2AB0
Based on	6ES7138-4DA04-0AB0 SIPLUS_ET200S 1COUNT 24V
Ambient conditions	
Extended ambient conditions	
<ul style="list-style-type: none"> • Relative to ambient temperature-atmospheric pressure-installation altitude 	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
- With condensation	100%, condensation/frost permissible. No commissioning if condensation present.
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

SIPLUS 1 COUNT 24 V/100 kHz counter module
(extended temperature range and medial exposure)
For universal counting and measuring tasks with ET 200S

Accessories

Article No.

6AG1138-4DA04-2AB0

See SIMATIC 1 COUNT 24 V/100 kHz counter module, page 9/180

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules - Technology modules

1 COUNT 5 V/500 kHz counter module

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 now 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

Article number	6ES7138-4DE02-0AB0 ET200S, EL-MOD., 1 COUNT 5V/500KHZ
Product type designation	
Supply voltage	
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
Input current	
from load voltage L+ (without load), max.	45 mA
from backplane bus 3.3 V DC, max.	10 mA
Encoder supply	
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	500 mA
Power losses	
Power loss, typ.	2 W
Hardware configuration	
Module exchange	
• Hot swapping the IM-DP	Yes
• Module exchange under process voltage	Yes

Article number	6ES7138-4DE02-0AB0 ET200S, EL-MOD., 1 COUNT 5V/500KHZ
Digital inputs	
Number of digital inputs	1
Functions	Gate control, synchronization, latch function
Input characteristic curve in accordance with IEC 61131, type 2	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
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.	2.5 μs
Cable length	
• shielded, max.	50 m

Technical specifications (continued)

Article number	6ES7138-4DE02-0AB0 ET200S, EL-MOD., 1 COUNT 5V/500KHZ
Digital outputs	
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)
Controlling a digital input	Yes
Switching capacity of the outputs	
• on lamp load, max.	10 W
Output voltage	
• Rated value (DC)	24 V
• for signal "0", max.	3 V
• 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.	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
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	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
Encoder	
Number of connectable encoders, max.	1
Connectable encoders	
• Incremental encoder (symmetrical)	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; > 500 kHz: 30 m

Article number	6ES7138-4DE02-0AB0 ET200S, EL-MOD., 1 COUNT 5V/500KHZ
Interrupts/diagnostics/status information	
Diagnostic messages	
• Diagnostic functions	Yes
Diagnostics 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
Integrated Functions	
Measuring functions	
Measuring range	
- Frequency measurement, min.	0.1 Hz
- Frequency measurement, max.	100 kHz
- Period measurement, min.	10 µs
- Period measurement, max.	120 s
- Velocity measurement, min.	1 1/min
- Velocity measurement, max.	25 000 1/min
Counter	
Number of counter inputs	1; 32 Bit
Parameter	
Remark	16 byte
Galvanic isolation	
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
Dimensions	
Width	30 mm
Height	81 mm
Depth	52 mm
Weights	
Weight, approx.	65 g

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules - Technology modules

1 COUNT 5 V/500 kHz counter module

Ordering data

Article No.

1 COUNT 5 V/500 kHz counter module

For universal counting and measuring tasks with ET 200S

Accessories

Label sheets DIN A4 (10 pieces)

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

- petrol
- red
- yellow
- light beige

6ES7193-4BH00-0AA0
6ES7193-4BD00-0AA0
6ES7193-4BB00-0AA0
6ES7193-4BA00-0AA0

Shield connection element

6ES7193-4GA00-0AA0

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

Shield clamps

6ES7193-4GB00-0AA0

For connecting braided cable shields to the busbar, 5 items

SIMODRIVE Incremental shaft encoder

With RS 422 (TTL), operating voltage 10 to 30 V

- With synchronous flange, universal axial/radial cable outlet with connector
 - 500 pulses/revolution
 - 1000 pulses/revolution
 - 1024 pulses/revolution
 - 1250 pulses/revolution
 - 1500 pulses/revolution
 - 2000 pulses/revolution
 - 2048 pulses/revolution
 - 2500 pulses/revolution
 - 3600 pulses/revolution
 - 5000 pulses/revolution
- With synchronous flange, radial flange outlet
 - 500 pulses/revolution
 - 1000 pulses/revolution
 - 1024 pulses/revolution
 - 1250 pulses/revolution
 - 1500 pulses/revolution
 - 2000 pulses/revolution
 - 2048 pulses/revolution
 - 2500 pulses/revolution
 - 3600 pulses/revolution
 - 5000 pulses/revolution

6FX2001-2DA50
6FX2001-2DB00
6FX2001-2DB02
6FX2001-2DB25
6FX2001-2DB50
6FX2001-2DC00
6FX2001-2DC04
6FX2001-2DC50
6FX2001-2DD60
6FX2001-2DF00

6FX2001-2FA50
6FX2001-2FB00
6FX2001-2FB02
6FX2001-2FB25
6FX2001-2FB50
6FX2001-2FC00
6FX2001-2FC04
6FX2001-2FC50
6FX2001-2FD60
6FX2001-2FF00

Article No.

- With synchronous flange, axial flange outlet

- 500 pulses/revolution
- 1000 pulses/revolution
- 1024 pulses/revolution
- 1250 pulses/revolution
- 1500 pulses/revolution
- 2000 pulses/revolution
- 2048 pulses/revolution
- 2500 pulses/revolution
- 3600 pulses/revolution
- 5000 pulses/revolution

6FX2001-2HA50
6FX2001-2HB00
6FX2001-2HB02
6FX2001-2HB25
6FX2001-2HB50
6FX2001-2HC00
6FX2001-2HC04
6FX2001-2HC50
6FX2001-2HD60
6FX2001-2HF00

- With clamping flange, universal axial/radial cable outlet with connector

- 500 pulses/revolution
- 1000 pulses/revolution
- 1024 pulses/revolution
- 1250 pulses/revolution
- 1500 pulses/revolution
- 2000 pulses/revolution
- 2048 pulses/revolution
- 2500 pulses/revolution
- 3600 pulses/revolution
- 5000 pulses/revolution

6FX2001-2NA50
6FX2001-2NB00
6FX2001-2NB02
6FX2001-2NB25
6FX2001-2NB50
6FX2001-2NC00
6FX2001-2NC04
6FX2001-2NC50
6FX2001-2ND60
6FX2001-2NF00

- With clamping flange, radial flange outlet

- 500 pulses/revolution
- 1000 pulses/revolution
- 1024 pulses/revolution
- 1250 pulses/revolution
- 1500 pulses/revolution
- 2000 pulses/revolution
- 2048 pulses/revolution
- 2500 pulses/revolution
- 3600 pulses/revolution
- 5000 pulses/revolution

6FX2001-2QA50
6FX2001-2QB00
6FX2001-2QB02
6FX2001-2QB25
6FX2001-2QB50
6FX2001-2QC00
6FX2001-2QC04
6FX2001-2QC50
6FX2001-2QD60
6FX2001-2QF00

- With clamping flange, axial flange outlet

- 500 pulses/revolution
- 1000 pulses/revolution
- 1024 pulses/revolution
- 1250 pulses/revolution
- 1500 pulses/revolution
- 2000 pulses/revolution
- 2048 pulses/revolution
- 2500 pulses/revolution
- 3600 pulses/revolution
- 5000 pulses/revolution

6FX2001-2SA50
6FX2001-2SB00
6FX2001-2SB02
6FX2001-2SB25
6FX2001-2SB50
6FX2001-2SC00
6FX2001-2SC04
6FX2001-2SC50
6FX2001-2SD60
6FX2001-2SF00

Signal cable

Preassembled for HTL and TTL encoder, without Sub-D connector, UL/DESINA.
For length code, see page 5/142.

6FX5002-2CA12-....

Overview



- 1-channel module for serial data communication via point-to-point link
- For message frames max. 224 bytes 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)

Technical specifications

Article number	6ES7138-4DF01-0AB0	6ES7138-4DF11-0AB0
	ET 200S, EL-MOD., 1SI,RS 232/422/485,3964R	ET 200S, EL-MOD.,1SI,RS 232/422/485 MODBUS
Product type designation		
Supply voltage		
Load voltage L+		
• Rated value (DC)	24 V	24 V
Input current		
from backplane bus 3.3 V DC, max.	10 mA	10 mA
from backplane bus 24 V DC, max.	80 mA; Typ. 20 mA	80 mA
Power losses		
Power loss, typ.	1.2 W	1.2 W
Memory		
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
Interfaces		
Number of interfaces	1	1
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
Point-to-point		
• 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)

I/O systems

ET 200 systems for the control cabinet
 ET 200S - I/O modules - Technology modules

1SI interface module**Technical specifications (continued)**

Article number	6ES7138-4DF01-0AB0 ET 200S, EL-MOD., 1SI,RS 232/422/485,3964R	6ES7138-4DF11-0AB0 ET 200S, EL-MOD., 1SI,RS 232/422/485 MODBUS
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
Telegram length, max.		
- 3964 (R)	224 byte	
- ASCII	224 byte	
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	
Transmission speed, RS232		
- 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	
Character frame (adjustable)		
- Bits per character	7 or 8	8
- Number of start/stop bits	1 or 2	1 or 2 (USS only 1)
- Bits per character frame	10	10 or 11 (USS only 11 bits)
- Parity	none, odd, even, any	none, odd, even (USI even only)
Number of bytes per PLC sampling cycle		
- Data quantity per PLC sampling cycle, receiving	32 byte; with IM151-1 Standard as of 6ES7151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7151-1BA01-0AB0; otherwise 8 bytes	32 byte; with IM151-1 Standard as of 6ES7151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7151-1BA01-0AB0; otherwise 8 bytes
- Data quantity per PLC sampling cycle, transmitting	32 byte; with IM151-1 Standard as of 6ES7151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7151-1BA01-0AB0; otherwise 8 bytes	32 byte; with IM151-1 Standard as of 6ES7151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7151-1BA01-0AB0; otherwise 8 bytes
Interrupts/diagnostics/status information		
Diagnostics indication LED		
• Receive RxD (green)	Yes	Yes
• Transmit TxD (green)	Yes	Yes
• Group error SF (red)	Yes	Yes

Technical specifications (continued)

Article number	6ES7138-4DF01-0AB0 ET 200S, EL-MOD., 1SI,RS 232/422/485,3964R	6ES7138-4DF11-0AB0 ET 200S, EL-MOD., 1SI,RS 232/422/485 MODBUS
Galvanic isolation		
Electrical isolation interface		
• between 422/485 and internal power supply	Yes	Yes
• between RS 232 and internal power supply	Yes	Yes
Ambient conditions		
Ambient temperature in operation		
• Min.	0 °C	0 °C
• max.	60 °C	60 °C
Storage/transport temperature		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Dimensions		
Width	15 mm	15 mm
Height	81 mm	81 mm
Depth	52 mm	52 mm
Weights		
Weight, approx.	50 g	50 g

Ordering data

Ordering data	Article No.	Article No.
1 SI interface module		Accessories
• ASCII and 3964(R) protocols	6ES7138-4DF01-0AB0	TM-E15S26-A1 terminal module
• Modbus and USS protocols	6ES7138-4DF11-0AB0	Ordering unit 5 items
		6ES7193-4CA40-0AA0
		TM-E15C26-A1 terminal module
		Ordering unit 5 items
		6ES7193-4CA50-0AA0
		TM-E15N24-A1 terminal module
		Ordering unit 5 items
		6ES7193-4CA80-0AA0
		TM-E15S24-01 terminal module
		Ordering unit 5 items
		6ES7193-4CB20-0AA0
		TM-E15C24-01 terminal module
		Ordering unit 5 items
		6ES7193-4CB30-0AA0
		TM-E15N24-01 terminal module
		Ordering unit 5 items
		6ES7193-4CB70-0AA0

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules - 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 bytes 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:
<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1138-4DF01-7AB0	6AG1138-4DF11-7AB0
Based on	6ES7138-4DF01-0AB0 SIPLUS ET 200S EM ET 1SI	6ES7138-4DF11-0AB0 SIPLUS ET 200S EM 1SI RS 232/422
Ambient conditions		
Ambient temperature in operation		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax	70 °C; = Tmax
Storage/transport temperature		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Extended ambient conditions		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity		
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

Article No.

1 SI interface module (extended temperature range and medial exposure)	
• ASCII and 3964(R) protocols • Modbus and USS protocols	6AG1138-4DF11-7AB0 6AG1138-4DF01-7AB0
Accessories	See SIMATIC 1 SI interface module, page 9/187

Overview



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	
<ul style="list-style-type: none"> • S7-400, S7-300, C7 • IM151-7 CPU • Automation systems from other manufacturers (possible with limitations) 	Through ET 200S Through backplane bus Through ET 200S
Communication interfaces	SIMATIC S7 (ET 200S backplane bus), RS 232, TTY
Connection of remote display (via serial TTY interface)	Display for weight value
Adjustment of scales settings	Using SIMATIC S7/C7 IM151-7 CPU or SIWATOOL CS PC parameter assignment software (RS 232)
Measuring accuracy	
Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K	0.05 %
Internal resolution	65 535
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

Load cell powering	
Supply voltage U_s (rated value)	6 V DC typ.
Max. supply current	≤ 68 mA
Permissible load impedance	
• R_{Lmin}	> 87 Ω
• R_{Lmax}	< 4 010 Ω
With SIWAREX IS Ex interface:	
• R_{Lmin}	> 87 Ω
• R_{Lmax}	< 4010 Ω
Load cell characteristic	1 mV/V to 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 _{US} Haz. Loc.
Auxiliary power supply	
Rated voltage	24 V DC
Max. current consumption	150 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
T_{min} (IND) to T_{max} (IND) (operating temperature)	
• Vertical installation	-10 ... +60 °C (14 ... 140 °F)
• Horizontal installation	-10 ... +40 °C (14 ... 104 °F)
EMC requirements according to	EN 61326, EN 45501 NAMUR NE21, Part 1
Dimensions	80 x 125 x 130 mm (3.15 x 4.92 x 5.12 inch)

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules - Technology modules

SIWAREX CS

Ordering data	Article No.	Article No.
SIWAREX CS Weighing electronics for scales in SIMATIC ET 200S	7MH4910-0AA01	
SIWAREX CS Manual Available in a range of languages Free download on the Internet at: 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: http://www.siemens.com/weighing-technology		
Configuration package SIWAREX CS on CD-ROM for SIMATIC S7, version V5.4 or higher • Software for SIWATOOL CS scale adjustment (in a range of languages) • Manuals available on CD (in a range of languages) • SIWAREX CS "Getting started"	7MH4910-0AK01	
SIWATOOL cable From SIWAREX U/CS with serial PC interface, for 9-pin PC interfaces (RS 232), length 3 m (9.84 ft)	7MH4607-8CA	
Installation material (mandatory)		
Terminal module TM-E 30 mm (1.18 inch) wide (required for each SIWAREX module)	6ES7193-4CG20-0AA0 or compatible	
Shield contact element Contents 5 items, sufficient for 5 cables	6ES7193-4GA00-0AA0	
Shield connection terminal Contents: 5 items, sufficient for 5 cables Note: one shield connection terminal is required each for the • scales connection and • TTY interface or • RS 232 interface	6ES7193-4GB00-0AA0	
N busbar, galvanized 3 x 10 mm (0.12 x 0.39 inch), 1.0 m (3.28 ft) long	8WA2842	
Feeder terminal for N busbar	8WA2868	
Remote displays (option) The digital remote displays can be connected directly to the SIWAREX CS through the TTY interface. <u>The following remote display can be used:</u> S102 Siebert Industrieelektronik GmbH P.O. Box 1180 66565 Eppelborn Germany Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: http://www.siebertgroup.com/en Detailed information available from manufacturer.		
Accessories		
SIWAREX JB junction box, aluminium housing For connecting up to 4 load cells in parallel, and for connecting several junction boxes		7MH4710-1BA
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel		7MH4710-1EA
Ex interface, type SIWAREX IS With ATEX approval, but without UL or FM approval for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC and CF weighing modules, Approved for use in the EU. • With short-circuit current < 199 mA DC • With short-circuit current < 137 mA DC		7MH4710-5BA 7MH4710-5CA
Cable (optional)		
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath To connect SIWAREX U, CS, MS, FTA, FTC 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 (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °F)		7MH4702-8AG
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath To connect the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °F)		7MH4702-8AF
Cable LiYCY 4 x 2 x 0.25 mm² For TTY (connect 2 pairs of conductors in parallel), for connection of a remote display		7MH4407-8BD0

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	
Integration in automation systems	
S7-400, S7-300, C7	Through ET 200S
Automation systems from other vendors	Possible through ET 200S with IM 151-1
Communication interfaces	SIMATIC S7 (ET 200S backplane bus), 8 bytes, I/O area
Module parameterization	Not required (module is pre-parameterized)
Measuring properties	
Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K	≤0.15 %
Signal resolution	14 bits plus 1 bit sign
Number of measurements/second	50
Low-pass filter	Without or 2 Hz
Sensors	In accordance with the principle of expansion measurement (full bridge) 4-wire connection

Sensor feed	
Supply voltage, short-circuit-proof	6 V DC ± 5 %
Permissible sensor resistance	
• R_{Lmin}	> 250 Ω
• R_{Lmax}	< 4010 Ω
Permissible sensor cell coefficient	Up to 4 mV/V
Permissible range of the measuring signal	-25.2 ... +25.2 mV
Auxiliary power supply	
Rated voltage	24 V DC
Max. current consumption	150 mA
Current consumption on backplane bus	Typ. 10 mA
Connection to sensors in Ex zone 1	Optionally via SIWAREX IS Ex interface
Ex approval zone 2 and safety	ATEX 95, cUL _{US} Haz. Loc.
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements T_{min} (IND) to T_{max} (IND) (operating temperature)	
• Vertical installation	0 ... +60 °C
• Horizontal installation	0 ... +40 °C
EMC requirements according to	NAMUR NE21, Part 1 89/386/EEC
Dimensions	30 x 80 x 50 mm (1.18 x 3.15 x 1.97 inch)

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules - Technology modules

SIWAREX CF

Ordering data	Article No.	Article No.
SIWAREX CF Weighing module for strain-gauge sensors in SIMATIC ET 200S (SIWAREX CF configuring package not required)	7MH4920-0AA01	
SIWAREX CF manual • German • English Free download on the Internet at: http://www.siemens.com/weighing		
SIWAREX CF "Getting started" Sample software for easy acquaintance with programming in STEP 7. Free download on the Internet at: http://www.siemens.com/weighing-technology		
Installation material (mandatory)		
Terminal module TM-E 30 mm (1.18 inch) wide (required for each SIWAREX module)	6ES7193-4CG20-0AA0 or compatible	
Shield contact element Contents 5 items, sufficient for 5 cables	6ES7193-4GA00-0AA0	
Shield connection terminal Contents: 5 items, sufficient for 5 cables One shield terminal element is required per sensor cable	6ES7193-4GB00-0AA0	
N busbar, galvanized 3 mm x 10 mm (0.12 in. x 0.39 in.), 1.5 m (4.92 ft.) long	8WA2842	
Feeder terminal for N busbar	8WA2868	
		Accessories
		SIWAREX EB extension box for extending sensor cables
		Ex interface, type SIWAREX IS With ATEX approval, but without UL or FM approvals , for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC and CF weighing modules. Approved for use in the EU. <ul style="list-style-type: none"> • With short-circuit current < 199 mA DC • With short-circuit current < 137 mA DC
		Cable (optional)
		Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath for connecting SIWAREX U, CS, MS, FTA, FTC 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 (0.43 in.) outer diameter, for ambient temperature -40 to +80 °C (-40 ... +176 °F)
		7MH4710-2AA 7MH4710-5BA 7MH4710-5CA 7MH4702-8AG

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 variants for accepting power modules and electronic modules
- Replaceable terminal box (even within the station network)
- Automatic coding of the electronics 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

Ordering data

TM-P terminal modules for PM-E power modules

TM-P15S23-A1

2 × 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals

Ordering unit 1 item

6ES7193-4CC20-0AA0

Ordering unit 5 items

6ES7193-4CC20-1AA0

TM-P15C23-A1

2 × 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

Ordering unit 1 item

6ES7193-4CC30-0AA0

Ordering unit 5 items

6ES7193-4CC30-1AA0

TM-P15N23-A1

6ES7193-4CC70-0AA0

Ordering unit 1 item
2 × 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect

TM-P15S23-A0

2 × 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals

Ordering unit 1 item

6ES7193-4CD20-0AA0

Ordering unit 5 items

6ES7193-4CD20-1AA0

TM-P15C23-A0

2 × 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals

Ordering unit 1 item

6ES7193-4CD30-0AA0

Ordering unit 5 items

6ES7193-4CD30-1AA0

Article No.

TM-P15N23-A0

6ES7193-4CD70-0AA0

Ordering unit 1 item
2 × 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, FastConnect

TM-P15S22-01

2 × 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals

Ordering unit 1 item

6ES7193-4CE00-0AA0

Ordering unit 5 items

6ES7193-4CE00-1AA0

TM-P15C22-01

2 × 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

Ordering unit 1 item

6ES7193-4CE10-0AA0

Ordering unit 5 items

6ES7193-4CE10-1AA0

TM-P15N22-01

6ES7193-4CE60-0AA0

Ordering unit 1 item
2 × 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect

TM-P30S44-A0

6ES7193-4CK20-0AA0

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

TM-P30C44-A0

6ES7193-4CK30-0AA0

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

I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

Terminal modules for power and electronic modules

Ordering data	Article No.	Ordering data	Article No.
TM-E terminal modules for electronic modules¹⁾		TM-E15C26-A1	6ES7193-4CA50-0AA0
TM-E15S24-A1 Ordering unit 5 items 2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	6ES7193-4CA20-0AA0	Ordering unit 5 items 2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	
TM-E15C24-A1 Ordering unit 5 items 2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	6ES7193-4CA30-0AA0	TM-E15N24-A1 Ordering unit 5 items 2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect	6ES7193-4CA70-0AA0
TM-E15S24-01 Ordering unit 5 items 2 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	6ES7193-4CB20-0AA0	TM-E15N26-A1 Ordering unit 5 items 2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect	6ES7193-4CA80-0AA0
TM-E15C24-01 Ordering unit 5 items 2 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	6ES7193-4CB30-0AA0	TM-E30S44-01 Ordering unit 1 item 4 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	6ES7193-4CG20-0AA0
TM-E15S23-01 Ordering unit 5 items 2 x 3 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	6ES7193-4CB00-0AA0	TM-E30C44-01 Ordering unit 1 item 4 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	6ES7193-4CG30-0AA0
TM-E15C23-01 Ordering unit 5 items 2 x 3 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	6ES7193-4CB10-0AA0	TM-E30S46-A1 Ordering unit 1 item 4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	6ES7193-4CF40-0AA0
TM-E15N23-01 Ordering unit 5 items 2 x 3 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect	6ES7193-4CB60-0AA0	TM-E30C46-A1 Ordering unit 1 item 4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	6ES7193-4CF50-0AA0
TM-E15N24-01 Ordering unit 5 items 2 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect	6ES7193-4CB70-0AA0	TM-E15S24-AT Ordering unit 1 item for internal temperature compensation with 2 AI TC High Feature, screw-type terminal	6ES7193-4CL20-0AA0
TM-E15S26-A1 Ordering unit 5 items 2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	6ES7193-4CA40-0AA0	TM-E15C24-AT Ordering unit 1 item for internal temperature compensation with 2 AI TC High Feature, spring-loaded terminals	6ES7193-4CL30-0AA0

¹⁾ Observe project planning help for selecting the suitable TM-E and TM-P

Terminal modules for power and electronic modules

Ordering data	Article No.	Ordering data	Article No.
Accessories for shield connection		Accessories for coding	
Shield connection element Ordering unit 5 pieces for plugging into TM-E and TM-P	6ES7193-4GA00-0AA0	Color coding plates Ordering unit 200 pieces for TM-P, TM-E	
Shield clamps Ordering unit 5 pieces for busbar 3 × 10 mm	6ES7193-4GB00-0AA0	<ul style="list-style-type: none"> • white • yellow • yellow/green • red • blue • brown • turquoise 	6ES7193-4LA20-0AA0 6ES7193-4LB20-0AA0 6ES7193-4LC20-0AA0 6ES7193-4LD20-0AA0 6ES7193-4LF20-0AA0 6ES7193-4LG20-0AA0 6ES7193-4LH20-0AA0
Grounding terminal Ordering unit 1 item for cable cross-sections up to 25 mm ²	8WA2868	Labels, inscribed Ordering unit 1 set	
3 × 10 mm busbars Ordering unit 1 item	8WA2842	200 items for slot numbering (1 to 20) 10 ×	8WA8861-0AB
		200 items for slot numbering (1 to 40) 5 ×	8WA8861-0AC
		100 items for slot numbering, inscription in plain text	8WA8848-0XA
		Labels, blank	
		200 items for slot numbering	8WA8848-2AY

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules

SIPLUS terminal modules for power and electronic modules

Overview



- Mechanical modules as receptacles for the electronics 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 electronics modules
- Replaceable terminal box (even within the station network)
- Automatic coding of the electronics 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS DP TM-P12S23-A0	
Article number	6AG1193-4CD20-2AA0
BasedOn Article No.	6ES7193-4CD20-0AA0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS DP TM-P15C23-A1	
Article No.	6AG1193-4CD30-2AA0
BasedOn Article No.	6ES7193-4CD30-0AA0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS DP TM-P15C22-01	
Article No.	6AG1193-4CE10-2AA0
BasedOn Article No.	6ES7193-4CE10-0AA0
Ambient temperature range	-40 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS DP TM-E15C23-01	
Article No.	6AG1193-4CB10-7AA0
BasedOn Article No.	6ES7193-4CB10-0AA0
Ambient temperature range	0 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS DP TM-E15N24-01	
Article No.	6AG1193-4CB70-7AA0
BasedOn Article No.	6ES7193-4CB70-0AA0
Ambient temperature range	-40 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

Overview (continued)

SIPLUS DP TM-E15C24-A1	
Article No.	6AG1193-4CA30-2AA0
BasedOn Article No.	6ES7193-4CA30-0AA0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS DP TM-E15C24-A1	
Article No.	6AG1193-4CB30-2AA0
BasedOn Article No.	6ES7193-4CB30-0AA0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS DP TM-E15S26-A1	
Article No.	6AG1193-4CA40-2AA0
BasedOn Article No.	6ES7193-4CA40-0AA0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS DP TM-E15C26-A1	
Article No.	6AG1193-4CA50-2AA0
BasedOn Article No.	6ES7193-4CA50-0AA0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS DP TM-E30C44-01	
Article No.	6AG1193-4CG30-2AA0
BasedOn Article No.	6ES7193-4CG30-0AA0
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS DP TM-E30C46-A1	
Article No.	6AG1193-4CF50-7AA0
BasedOn Article No.	6ES7193-4CF50-0AA0
Ambient temperature range	-40 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS DP TM-E15C24-AT	
Article No.	6AG1193-4CL30-7AA0
BasedOn Article No.	6ES7193-4CL30-0AA0
Ambient temperature range	0 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

Ambient conditions	
Relative humidity	5 ... 100 % 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 ¹⁾²⁾
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 (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

¹⁾ ISA-S71.04 severity level GX: Long-term load: SO₂ < 4.8 ppm; H₂S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH₃ < 49 ppm; O₃ < 0.1 ppm; NO_x < 5.2 ppm limit value (max. 30 min/d); SO₂ < 17.8 ppm; H₂S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH₃ < 247 ppm; O₃ < 1.0 ppm; NO_x < 10.4 ppm

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

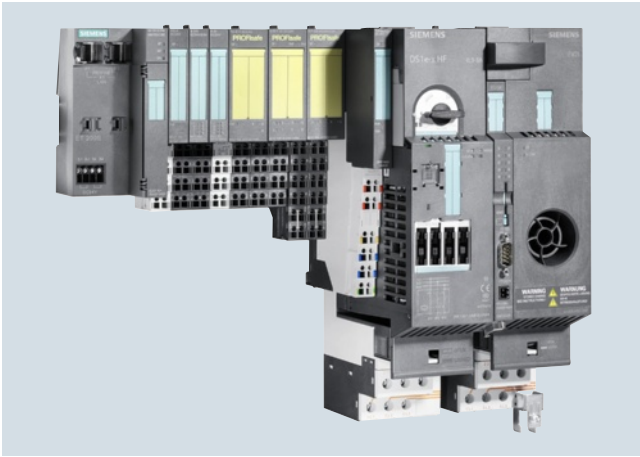
For further technical documentation on SIPLUS, see:
<http://www.siemens.com/siplus-extreme>

I/O systems

ET 200 systems for the control cabinet
ET 200S - I/O modules

SIPLUS terminal modules for power and electronic modules

Ordering data	Article No.	Article No.
TM-P terminal modules for PM-E power modules		Accessories for shield connection
(extended temperature range and medial exposure)		Shield connection element 6ES7193-4GA00-0AA0
SIPLUS ET 200S TM-P15C23-A0	6AG1193-4CD20-2AA0	Ordering unit: 5 units For plugging into TM-E and TM-P
Ordering unit: 1 unit 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw connection		Shield clamps 6ES7193-4GB00-0AA0
SIPLUS ET 200S TM-P15C23-A0	6AG1193-4CD30-2AA0	Ordering unit: 5 units For busbar 3 x 10 mm
Ordering unit: 1 unit 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals		Ground terminal 8WA2868
SIPLUS ET 200S TM-P15C22-01	6AG1193-4CE10-2AA0	Ordering unit: 1 unit For cable cross-sections up to 25 mm ²
Ordering unit: 1 unit 2 x 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		Busbars 3 x 10 mm 8WA2842
		Ordering unit: 1 unit
TM-E terminal modules for electronics modules		Accessories for coding
(extended temperature range and medial exposure)		Color coding plates
SIPLUS ET 200S TM-E15C23-01	6AG1193-4CB10-7AA0	Ordering unit: 200 units for TM-P, TM-E
Ordering unit: 5 units 2 x 3 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		<ul style="list-style-type: none"> • White 6ES7193-4LA20-0AA0 • Yellow 6ES7193-4LB20-0AA0 • Yellow/green 6ES7193-4LC20-0AA0 • Red 6ES7193-4LD20-0AA0 • Blue 6ES7193-4LF20-0AA0 • Brown 6ES7193-4LG20-0AA0 • Turquoise 6ES7193-4LH20-0AA0
SIPLUS ET 200S TM-E15N24-01	6AG1193-4CB70-7AA0	Labels, inscribed
Ordering unit: 5 units 2 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect		Ordering unit: 1 set
SIPLUS ET 200S TM-E15C24-A1	6AG1193-4CA30-2AA0	200 units for slot numbering (1 to 20) 10 x 8WA8861-0AB
Ordering unit: 5 units 2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		200 units for slot numbering (1 to 40) 5 x 8WA8861-0AC
SIPLUS ET 200S TM-E15C24-01	6AG1193-4CB30-2AA0	Labels, blank
Ordering unit: 5 units 2 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		200 units for slot numbering 8WA8848-2AY
SIPLUS ET 200S TM-E15S26-A1	6AG1193-4CA40-2AA0	
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	6AG1193-4CA50-2AA0	
Ordering unit: 5 units 2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		
SIPLUS ET 200S TM-E30C44-01	6AG1193-4CG30-2AA0	
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	6AG1193-4CF50-7AA0	
Ordering unit: 1 units 4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		
SIPLUS ET 200S TM-E15C24-AT	6AG1193-4CL30-7AA0	
Ordering unit: 1 unit For internal temperature compensation with 2 AI TC High Feature, spring-loaded terminals		

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.

I/O systems

ET 200 systems for the control cabinet
ET 200S - Fail-safe I/O modules

PM-E F PROFIsafe F power modules

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 PL e according to ISO 13849.1 and SIL 2 (IEC 61508) (up to 10 A). The following modules can be used down-circuit of the power modules.
 - 2DO / 0.5 A ST, 6ES7132-4BB01-0AA0
 - 2 DO / 2 A ST, 6ES7132-4BB31-0AA0
 - 2 DO / 0.5 A HF, 6ES7132-4BB01-0AB0
 - 2 DO / 2 A HF, 6ES7132-4BB31-0AB0
 - 4 DO / 0.5 A ST, 6ES7132-4BD01-0AA0
 - 4 DO / 2 A ST, 6ES7132-4BD31-0AA0

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

Article number	6ES7138-4CF03-0AB0	6ES7138-4CF42-0AB0
	ET200S, POWERMOD. PM-E F PM, DC24V	ET200S, POWERMOD. PM-E F PP, DC24V
Product type designation		
Supply voltage		
Load voltage L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	No	No
Input current		
from load voltage L+ (without load), max.	typ. 100 mA	typ. 100 mA
from backplane bus 24 V DC, max.	28 mA	28 mA
Current carrying capacity		
up to 30 °C, max.		10 A
up to 40 °C, max.	10 A	8 A
up to 60 °C, max.	6 A	7 A
Power losses		
Power loss, typ.	4 W	4 W
Address area		
Address space per module		
• without packing	5 byte; Input and output in each case	5 byte; Input and output in each case
Digital inputs		
Cable length		
• shielded, max.	200 m	200 m
• Unshielded, max.	200 m	200 m
Digital outputs		
Number of digital outputs	2	1; Relays
short-circuit protection	Yes; Electronic	No
• Response threshold, typ.	Response threshold (short-circuit): 5 to 12 A; 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)	
Controlling a digital input	No	Yes

Technical specifications (continued)

Article number	6ES7138-4CF03-0AB0 ET200S, POWERMOD. PM-E F PM, DC24V	6ES7138-4CF42-0AB0 ET200S, POWERMOD. PM-E F PP, DC24V
Switching capacity of the outputs • on lamp load, max.	10 W	100 W
Load resistance range • lower limit • upper limit	12 Ω 1 kΩ	
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 • for signal *1* permissible range for 0 to 60 °C, min. • for signal *1* permissible range for 0 to 60 °C, max. • for signal *0* residual current, max.	2 A 20 mA 2.4 A 0.5 mA	
Parallel switching of 2 outputs • for increased power • for redundant control of a load	No No	
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max.	30 Hz 0.1 Hz 10 Hz	2 Hz 0.1 Hz; with inductive load to IEC 947-5-1, DC-13 / AC-15 2 Hz
Aggregate current of outputs (per group) horizontal installation - up to 40 °C, max. - up to 55 °C, max. - up to 60 °C, max. vertical installation - up to 40 °C, max.	10 A 7 A 6 A 6 A	10 A 8 A 7 A 8 A
Relay outputs Switching capacity of contacts - at ohmic load, up to 50 °C, max.	10 A	10 A
Cable length • shielded, max. • Unshielded, max.	200 m 200 m	

I/O systems

ET 200 systems for the control cabinet

ET 200S - Fail-safe I/O modules

PM-E F PROFIsafe F power modules**Technical specifications** (continued)

Article number	6ES7138-4CF03-0AB0 ET200S, POWERMOD. PM-E F PM, DC24V	6ES7138-4CF42-0AB0 ET200S, POWERMOD. PM-E F PP, DC24V
Interrupts/diagnostics/ status information		
Diagnostic messages		
• Diagnostic functions	Yes	Yes
• Diagnostic information readable	Yes	Yes
• Diagnostics	Yes	
• Wire break	Yes	No
• Short circuit	Yes	Yes
• Missing load voltage	Yes	Yes
Diagnostics indication LED		
• Rated load voltage PWR (green)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
Galvanic isolation		
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
Isolation		
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
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
• acc. to EN 954	4	4
• SIL according to IEC 61508	Up to SIL 3	With Std-DO: Max. SIL 2, without Std-DO max. SIL 3 depending on configuration
Dimensions		
Width	30 mm	30 mm
Height	81 mm	81 mm
Depth	52 mm	52 mm
Weights		
Weight, approx.	88 g	80 g

Ordering data	Article No.	Ordering data	Article No.
PM-E F pm PROFIsafe power module, 24 V DC For safe shutdown of digital output modules	6ES7138-4CF03-0AB0	S7 Distributed Safety programming tool V5.4 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher	
PM-E F pp PROFIsafe power module, 24 V DC For safe shutdown of digital output modules	6ES7138-4CF42-0AB0	Floating license	6ES7833-1FC02-0YA5
Accessories		Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery	6ES7833-1FC02-0YH5
IM 151-1 HIGH FEATURE interface module For ET 200S; transfer rate up to 12 Mbit/s; data volumes 244 bytes 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	6ES7151-1BA02-0AB0	S7 Distributed Safety Upgrade From V5.x to V5.4; floating license for 1 user	6ES7833-1FC02-0YE5
IM 151-3 PN HF interface module 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	6ES7151-3BA23-0AB0	STEP 7 Safety Advanced V13 SP1 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1	
IM 151-3 PN FO interface module 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	6ES7151-3BB23-0AB0	Floating license for 1 user	6ES7833-1FA13-0YA5
Terminal modules for power modules		Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery	6ES7833-1FA13-0YH5
TM-P30S44-A0 Ordering unit 1 item 7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals for PM-E F PROFIsafe	6ES7193-4CK20-0AA0	SIMATIC Manual Collection 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	6ES7998-8XC01-8YE0
TM-P30C44-A0 Ordering unit 1 item 7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals for PM-E F PROFIsafe	6ES7193-4CK30-0AA0	SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2

¹⁾ For up-to-date information and download availability, see:
<http://www.siemens.com/tia-online-software-delivery>

I/O systems

ET 200 systems for the control cabinet
ET 200S - Fail-safe I/O modules

F electronic modules

Overview



F electronic modules are 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 SIL 3 (IEC 61508) and 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 SIL 3 (IEC 61508), PL e (ISO 13849)

Fail-safe digital hybrid module

- 4 fail-safe inputs/3 fail-safe outputs
- Certified up to SIL 2 (IEC 61508) and 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

Article number	6ES7138-4FA05-0AB0
	ET200S, EL-MOD., 4/8 F-DI, DC 24V
Product type designation	
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Encoder supply	
Number of outputs	2
Type of output voltage	min. L+ (-1.5 V)
short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)
Output current	
• nominal	300 mA
• permissible range	0 to 300 mA
Address area	
Occupied address area	
• Inputs	6 byte
• Outputs	4 byte
Digital inputs	
Number of digital inputs	8; 8 (one-channel); 4 (two-channel)
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
• Number of simultaneously controllable inputs	8
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
Input current	
• for signal "1", typ.	3.7 mA

Article number	6ES7138-4FA05-0AB0
	ET200S, EL-MOD., 4/8 F-DI, DC 24V
Input delay (for rated value of input voltage)	
for standard inputs	
- Parameterizable	Yes
- at "0" to "1", min.	0.3 ms
- at "0" to "1", max.	17 ms
- at "1" to "0", min.	0.3 ms
- at "1" to "0", max.	17 ms
Cable length	
• shielded, max.	500 m
• Unshielded, max.	500 m
Encoder	
Connectable encoders	
• 2-wire sensor	No
- Permissible quiescent current (2-wire sensor), max.	0.6 mA; max.
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Short circuit	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital input (green)	Yes
Galvanic isolation	
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

Technical specifications (continued)

Article number	6ES7138-4FA05-0AB0 ET200S, EL-MOD., 4/8 F-DI, DC 24V
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• SIL according to IEC 61508	SIL 2 (single-channel), SIL 3 (two-channel)
Dimensions	
Width	30 mm
Height	81 mm
Depth	52 mm
Weights	
Weight, approx.	78 g
Article number	6ES7138-4FB04-0AB0 ET200S, EL-MOD., 4 F-DO, DC 24V/2A
Product type designation	
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	No
Input current	
from load voltage L+ (without load), max.	typ. 100 mA
from backplane bus 3.3 V DC, max.	28 mA
Digital outputs	
Number of digital outputs	4
short-circuit protection	Yes
Limitation of inductive shutdown voltage to	Typ. (2L+) -47 V
Controlling a digital input	No
Switching capacity of the outputs	
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	1 kΩ
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; P- and M-switching
Parallel switching of 2 outputs	
• for increased power	No
• for redundant control of a load	No
Switching frequency	
• with resistive load, max.	30 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; Symmetrical
• on lamp load, max.	10 Hz; Symmetrical
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
Cable length	
• shielded, max.	500 m
• Unshielded, max.	500 m

Article number	6ES7138-4FB04-0AB0 ET200S, EL-MOD., 4 F-DO, DC 24V/2A
Interrupts/diagnostics/status information	
Diagnostic messages	
• Diagnostic functions	Yes
• Wire break	Yes
• Short circuit	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes
Galvanic isolation	
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
Isolation tested with	
• Load voltage L+ against backplane bus	2545 V DC
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• SIL according to IEC 61508	SIL 3
Dimensions	
Width	30 mm
Height	81 mm
Depth	52 mm
Weights	
Weight, approx.	85 g
Article number	6ES7138-4FC01-0AB0 ET200S, EL-MOD., 4 F-DI/3 F-DO, DC 24V/2A
Product type designation	
Supply voltage	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Digital inputs	
Number of digital inputs	4
Input voltage	
• Type of input voltage	DC
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• SIL according to IEC 61508	2
Dimensions	
Width	30 mm
Height	81 mm
Depth	52 mm

I/O systems

ET 200 systems for the control cabinet

ET 200S - Fail-safe I/O modules

F electronic modules

Ordering data	Article No.	Article No.
4/8 F-DI PROFIsafe 24 V DC electronic module 30 mm wide, up to PL e according to ISO 13849.1	6ES7138-4FA05-0AB0	
4 F-DO PROFIsafe 24 V DC/2A electronic module 30 mm wide, up to PL e according to ISO 13849.1	6ES7138-4FB04-0AB0	
4 F-DI / 3 F-DO PROFIsafe 24 V DC/2A electronic module 30 mm wide, up to PL e according to ISO 13849.1 / SIL 2 (IEC 62061)	6ES7138-4FC01-0AB0	
Accessories		
Terminal modules for electronic modules	See F terminal modules	
IM 151-1 High Feature interface module 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	6ES7151-1BA02-0AB0	
IM 151-3 PN HF interface module 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	6ES7151-3BA23-0AB0	
IM 151-3 PN FO interface module 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	6ES7151-3BB23-0AB0	
		S7 Distributed Safety programming tool V5.4 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher Floating license Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery
		S7 Distributed Safety Upgrade From V5.x to V5.4; floating license for 1 user
		STEP 7 Safety Advanced V13 SP1 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1 Floating license for 1 user Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery
		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)
		SIMATIC Manual Collection – Update service for 1 year Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates

¹⁾ For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

Overview



The digital F electronic module relay 1 F-RO 24 V DC / 5 A 24 to 230 V AC / 5 A 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 SIL 3 (IEC 61508), 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

Article number	6ES7138-4FR00-0AA0 ET200S, 1 F-RO DC24V/5A AC24..230V/5A
Product type designation	
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V; Supply via fail-safe output, e.g. of an F-DO
Input current	
from load voltage L+ (without load), max.	100 mA; from control voltage
from backplane bus 3.3 V DC, max.	10 mA
Power losses	
Power loss, typ.	2.1 W
Address area	
Address space per module	
• with packing	2 bit
• without packing	1 byte
Digital outputs	
Number of digital outputs	1
short-circuit protection	No
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
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

Article number	6ES7138-4FR00-0AA0 ET200S, 1 F-RO DC24V/5A AC24..230V/5A
Relay outputs	
Switching capacity of contacts	
- Thermal continuous current, max.	5 A
Cable length	
• shielded, max.	200 m
• Unshielded, max.	200 m
Diagnostics indication LED	
• Status indicator digital output (green)	Yes
Galvanic isolation	
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
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• acc. to EN 954	4
• SIL according to IEC 61508	Up to SIL 3
Dimensions	
Width	30 mm
Height	81 mm
Depth	52 mm
Weights	
Weight, approx.	90 g

I/O systems

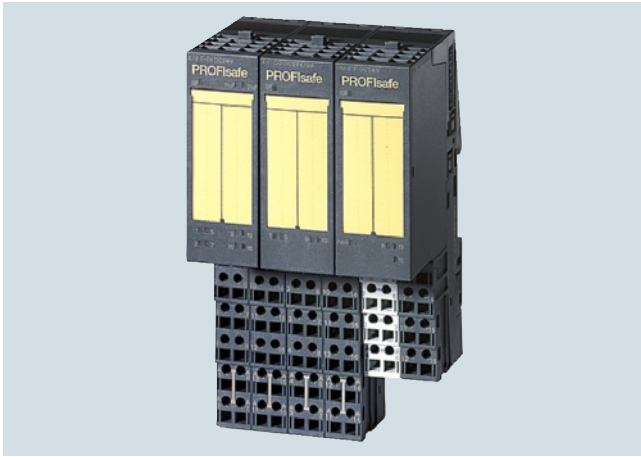
ET 200 systems for the control cabinet
 ET 200S - Fail-safe I/O modules

F electronic module relays

Ordering data	Article No.	Article No.
1 F-RO F electronic module relay Relay output (2 NO contacts), output current 5 A, load voltages DC 24 V and AC 24 ... 230 V, can be used at up to Category 4/SIL3, if controlled via F-DO	6ES7138-4FR00-0AA0	
Accessories		
Terminal modules for electronic modules	See F terminal modules	
IM 151-1 High Feature interface module 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	6ES7151-1BA02-0AB0	
IM 151-3 PN HF interface module 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	6ES7151-3BA23-0AB0	
IM 151-3 PN FO interface module 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	6ES7151-3BB23-0AB0	
		S7 Distributed Safety programming tool V5.4 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher Floating license 6ES7833-1FC02-0YA5 6ES7833-1FC02-0YH5 Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery
		S7 Distributed Safety Upgrade From V5.x to V5.4; floating license for 1 user 6ES7833-1FC02-0YE5
		STEP 7 Safety Advanced V13 SP1 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1 Floating license for 1 user 6ES7833-1FA13-0YA5 6ES7833-1FA13-0YH5 Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery
		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) 6ES7998-8XC01-8YE0
		SIMATIC Manual Collection – Update service for 1 year Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates 6ES7998-8XC01-8YE2

¹⁾ For up-to-date information and download availability, see:
<http://www.siemens.com/tia-online-software-delivery>

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

F-terminal modules for power modules

TM-P15S23-A1

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

Ordering unit 1 item

6ES7193-4CC20-0AA0

Ordering unit 5 items

6ES7193-4CC20-1AA0

TM-P15C23-A1

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

Ordering unit 1 item

6ES7193-4CC30-0AA0

Ordering unit 5 items

6ES7193-4CC30-1AA0

TM-P15S23-A0

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

Ordering unit 1 item

6ES7193-4CD20-0AA0

Ordering unit 5 items

6ES7193-4CD20-1AA0

TM-P15C23-A0

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

Ordering unit 1 item

6ES7193-4CD30-0AA0

Ordering unit 5 items

6ES7193-4CD30-1AA0

Article No.

TM-P15S22-01

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

Ordering unit 1 item

6ES7193-4CE00-0AA0

Ordering unit 5 items

6ES7193-4CE00-1AA0

TM-P15C22-01

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

Ordering unit 1 item

6ES7193-4CE10-0AA0

Ordering unit 5 items

6ES7193-4CE10-1AA0

TM-P30S44-A0

6ES7193-4CK20-0AA0

Ordering unit 1 item
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

6ES7193-4CK30-0AA0

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

I/O systems

ET 200 systems for the control cabinet

ET 200S - Fail-safe I/O modules

F terminal modules

Ordering data	Article No.	Ordering data	Article No.
F-terminal modules for electronic modules		Accessories	
TM-E30S44-01 Ordering unit 1 item 4 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	6ES7193-4CG20-0AA0	Color coding plates Ordering unit 200 pieces for TM-P, TM-E • white • yellow • yellow/green • red • blue • brown • turquoise	6ES7193-4LA20-0AA0 6ES7193-4LB20-0AA0 6ES7193-4LC20-0AA0 6ES7193-4LD20-0AA0 6ES7193-4LF20-0AA0 6ES7193-4LG20-0AA0 6ES7193-4LH20-0AA0
TM-E30C44-01 Ordering unit 1 item 4 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	6ES7193-4CG30-0AA0	Grounding terminal Ordering unit 1 item For cable cross-sections up to 25 mm ²	8WA2868
TM-E30S46-A1 Ordering unit 1 item 4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	6ES7193-4CF40-0AA0	3 x 10 mm busbars Ordering unit 1 item	8WA2842
TM-E30C46-A1 Ordering unit 1 item 4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	6ES7193-4CF50-0AA0	Labels, inscribed Ordering unit 1 set • 200 items for slot numbering (1 to 20) 10 x • 200 items for slot numbering (1 to 40) 5 x • 100 items for slot numbering, inscription in plain text	8WA8861-0AB 8WA8861-0AC 8WA8848-0XA
		Labels, blank 200 items for slot numbering	8WA8848-2AY

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, in both PROFIBUS and PROFINET configurations.

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

Note:

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

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1138-4FA05-2AB0
Based on	6ES7138-4FA05-0AB0 SIPLUS ET200S EM F-DI 24V PROFISAFE
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C
• max.	60 °C
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
• At cold restart, min.	-25 °C
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Article number	6AG1138-4FB04-2AB0
Based on	6ES7138-4FB04-0AB0 SIPLUS ET200S EM F-DO 24V PROFISAFE
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C
• max.	60 °C
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
• At cold restart, min.	-25 °C
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

I/O systems

ET 200 systems for the control cabinet

ET 200S - Fail-safe I/O modules

SIPLUS F electronic modules

Ordering data	Article No.		Article No.
SIPLUS F electronic modules (extended temperature range and medial exposure)		Accessories	See SIMATIC F electronic modules, page 9/210
4/8 F DI PROFIsafe 24 V DC electronic module 30 mm construction width, up to Category 4 (EN 954-1)	6AG1138-4FA05-2AB0		
4 F-DO PROFIsafe 24 V DC/2 A electronic module 30 mm construction width, up to Category 4 (EN 954-1)	6AG1138-4FB04-2AB0		

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 four IO-Link devices can be connected to each IO-Link master module (three-wire connection). 3RA6 compact starters or load feeders with 3RA27 function modules can even be bundled in groups of four devices each at an IO-Link port. This means that up to 16 load feeders can be connected to the controller at an IO-Link master module.
- Up to 4 standard 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 terminal)
 - TM-E15C26-A1 (spring-loaded terminal)
 - TM-E15N26-A1 (FastConnect)
- Supports firmware update (STEP 7 V5.4 SP4 and higher)
- Corresponds to IO-Link specification V1.0

Ordering data

4SI IO-Link electronic module
IO-Link master, screw terminal,
spring-loaded terminal or
FastConnect connection method

Article No.

6ES7138-4GA50-0AB0

Article No.

Accessories

Universal terminal module for
ET 200S

- TM-E15S26-A1
with screw terminal
- TM-E15C26-A1
with spring-loaded terminal
- TM-E15N26-A1
with FastConnect

6ES7193-4CA40-0AA0

6ES7193-4CA50-0AA0

6ES7193-4CA80-0AA0

I/O systems

ET 200 systems for the control cabinet
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 multifunctional, distributed I/O system SIMATIC ET 200S on a total of four ports.

Features

- Up to 4 SIRIUS devices can be connected to the 4 ports of each 4SI SIRIUS electronic module. 3RA6 compact starters or load feeders with 3RA27 function modules can even be bundled in groups of 4 devices each at an IO-Link port. This means that up to 16 load feeders can be connected to the controller at an IO-Link master module.
- The electronic module 4SI SIRIUS is 15 mm in width and can be used with the following universal terminal modules:
 - TM-E15S26-A1 (screw terminal)
 - TM-E15C26-A1 (spring-loaded terminal)
 - TM-E15N26-A1 (FastConnect)
- Supports firmware updates (STEP 7 V5.4 SP5 and higher)
- Corresponds to IO-Link specification V1.0

Ordering data

4SI SIRIUS electronic module

For the connection of SIRIUS switching devices to ET 200S; 4 ports. Screw terminal, spring-loaded terminal, or FastConnect connection method

Article No.

3RK1005-0LB00-0AA0

Article No.

Accessories

Universal terminal module for ET 200S

- TM-E15S26-A1 with screw terminal
- TM-E15C26-A1 with spring-loaded terminal
- TM-E15N26-A1 with FastConnect

6ES7193-4CA40-0AA0

6ES7193-4CA50-0AA0

6ES7193-4CA80-0AA0

ET 200S manual for 4SI SIRIUS electronic module

Note:
<http://support.automation.siemens.com/WW/view/en/37856470>

Overview

ET 200S motor starters in the ET 200S I/O system

The SIMATIC ET 200S is the multifunctional and bit-modular I/O system in degree of protection IP20 for exact adaptation 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 act as a miniature controller.

The ET 200S is designed for combining with a large 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.

In addition to the standard versions, SIPLUS versions are available both for interface modules and I/O modules. They can be

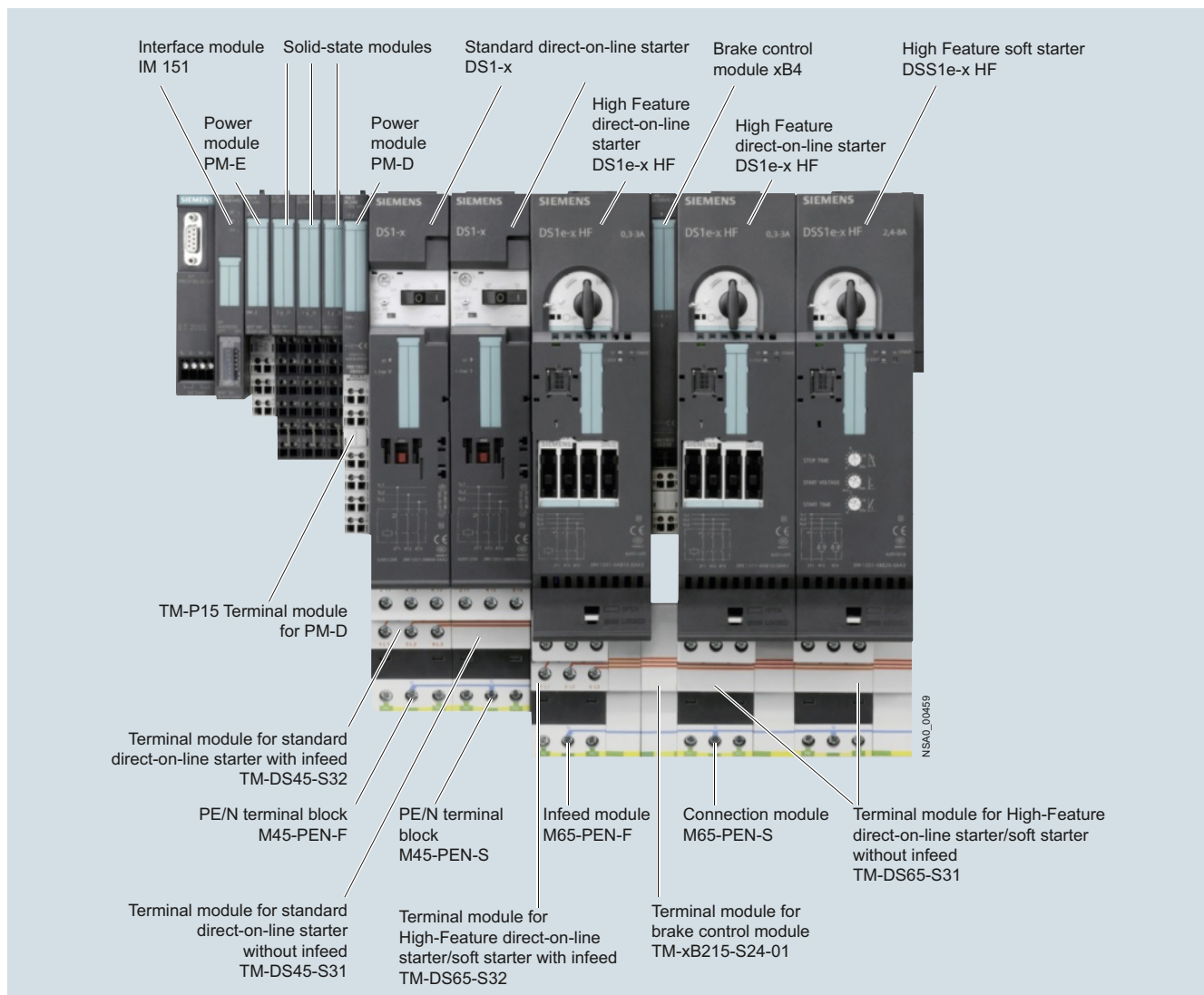
used for an extended temperature range and increased medial loads.

Device replacement is easy and quick thanks to permanent wiring and automatic re-parameterization.

Hot swapping, i.e. the disconnection and connection of modules without prior isolation, ensures high availability of the automation system along with extensive diagnostics information.

The ET 200S motor starters are connected to the control system and parameterized through the fieldbus using either PROFIBUS or PROFINET via IM modules – available in both standard and safety-related versions.

With the ET 200S motor starters, any AC loads can be protected and switched. The communication interface makes them ideal for operation in distributed control cabinets or control enclosures.



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

I/O systems

ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

General data

Motor starter versions

The ET 200S motor starters are available as direct-on-line, reversing or soft starter versions:

- **Standard motor starters** up to 5.5 kW (direct-on-line and reversing starters)
- **High Feature motor starters** up to 7.5 kW (direct-on-line, reversing and direct-on-line soft starters)
- **Failsafe motor starters** up to 7.5 kW (direct-on-line and reversing starters)
 - Properties of the High Feature motor starter
 - Failsafe functionality

Innovation of the ET 200S High Feature motor starters

The ET 200S High Feature motor starters have undergone radical innovation and now support the acyclic services on PROFIBUS and PROFINET as well as PROFlenergy on PROFINET. They are now:

- Even more flexible – flexible assignment of parameters
- Even better integrated in TIA (Totally Integrated Automation)
- Even more transparent – through comprehensive diagnostic data records
- Even more anticipatory – through maintenance functions
- Energy-efficient – through PROFlenergy

Basic functionality of the ET 200S motor starters

All versions of the ET 200S motor starters have the following functionality. Any additional specific functionality is described for the respective versions.

- Fully pre-wired motor starters for switching and protecting any AC loads up to 7.5 kW at 400 V AC and 500 V AC
- With self-assembling 40/50 A power bus, i.e. the load voltage is only fed in once for a group of motor starters
- All control supply voltages connected only once, i.e. when modules are added they are automatically connected to the next module
- Hot swapping is permissible
- Inputs and outputs for activating and signaling the states are already integrated
- Control of the motor starter from the control system and of the diagnostics status via the cyclic process image
- Diagnostics 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 states of contactor(s) or soft starters, and system faults.
- Interface for controlling an expansion module, e.g. brake control module 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-related system components (IEC 62061 and ISO 13849-1).

Mounting

As the motor starters are fully pre-wired, up to 80 % of the wiring outlay can be saved. The control cabinets can be assembled far more quickly and compactly.

Expansions are easily possible through the subsequent adding of terminal modules. With their terminal block design (10 mm²), the latter also do away with the distribution wiring otherwise required. Through the permanent wiring and the "hot swapping" function (disconnection and connection during operation) a motor starter can be replaced within seconds if necessary. The motor starters are therefore recommendable in particular for applications with special demands on availability.

Parameterization and configuration

Configuration is made easier by the bit-modular structure.

When using the ET 200S motor starters, the list of parts per load feeder is reduced to two main items: The passive terminal module and the motor starter. This makes the ET 200S ideal for modular machine concepts as well.

All ET 200S motor starters are set up without fuses. Contactors and soft starters are activated through the integrated outputs. The inputs of the motor starters evaluate the signal states of the protective devices (short circuit or overload), the switching states of contactor(s) or soft starters, and system faults.

The motor starter protector signaling is freely programmable with regard to group fault signals (group fault at motor starter protector "Off"/group fault signal at motor starter protector "Off" only in case of "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 is butt-mounted to the right of a motor starter, it is possible to control a mechanical holding brake on a three-phase motor from the process image of the motor starter.

Motors with 24 V DC brakes (xB1, xB3) as well as motors with 500 V DC brakes (xB2, xB4) can be controlled using the brake control modules xB1-xB4.

The modules xB5 (without digital input) and xB6 (with two digital inputs) have been added to the range in order to control a mechanical holding brake with a rated operational voltage of 400 V AC. A further motor brake voltage commonly found on the market is thus supported.

The 24 V DC brakes have an external supply and can be released independently of the switching state of the motor starter. By contrast the 500 V DC brakes and the 400 V AC brakes usually have a direct supply from the terminal board of the motor through a rectifier module and therefore cannot be released 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 also be used for other purposes, e.g. for controlling DC valves.

With two digital inputs available on the brake control modules (xB3, xB4, xB6) and another two digital inputs available on the optional control module 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. The signals of these digital inputs are in the process image and are reported to the control system.

Power supply through terminal modules

Power is supplied through the terminal modules for motor starters:

- The auxiliary voltages are fed in only once via the PM-D or PM-DFx power module which must be connected to the left of the first motor starter.
- The load voltage is fed in at the first (left) TM-xxxxS32 terminal module of a motor starter. The other TM-xxxxS31 terminal modules are automatically supplied with power through the integrated power bus when they are mounted side by side. If the power bus is utilized to its full capacity of 40 A for Standard motor starters or 50 A for High Feature motor starters, a new supply must be fed in through an additional TM-xxxxS32 terminal module.

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 I/O modules. The self-assembling voltage buses integrated into the terminal modules reduce the wiring outlay to the single infeed (both of auxiliary and load voltage). All modules following on the right are automatically supplied upon plugging the terminal modules together. The rugged 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.

Terminal modules with the suffix "-S32"

- The terminal modules with the suffix "-S32" have connection terminals for feeding into the integrated 40A/50A power bus and connection terminals for the motor connection cable. They are mounted at the beginning (left) of a power bus segment.
- To configure a new load group, another "-S32" terminal module is plugged in.
- The "-S32" terminal modules are supplied with three caps for closing the power bus contacts on the final terminal module of a segment.
- Optionally expandable with PE/N modules

Terminal modules with the suffix "-S31"

- The terminal modules with the suffix "-S31" only have 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 connection terminals of the terminal modules for motor starters are equipped with powerful 10 mm² screw terminals.

Power modules (page 9/227)

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 modules for PM-D power modules (page 9/228)

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

ET 200S Safety motor starters with integrated safety technology

The safety-related, communication-capable ET 200S motor starters offer the right solution for every safety application. The range extends from the simple local safety solution through to the user-friendly version with PROFIsafe, which can be used in conjunction with a safe control system (see "Safety Modules local and PROFIsafe", page 9/232).

The safety technology is an integral part and is therefore pre-wired at the factory.

The ET 200S Safety Motor Starter Solutions comprise:

- Safety modules (page 9/233)
- Standard motor starters (page 9/221)
- High Feature motor starters (page 9/224)
- Failsafe motor starters (page 9/229)

System configuration with ET 200S motor starters

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

- Conventional ET 200S motor starter solution consisting of:
 - PM-D module
 - Standard motor starter or High Feature motor starter
- ET 200S Safety Motor Starter Solution local (page 9/232)
- ET 200S Safety Motor Starter Solutions PROFIsafe (page 9/236)

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 function block library contains the diagnostics and driver blocks corresponding with the diagnostics and driver concept of SIMATIC PCS 7 as well as the elements required for operation and monitoring (symbols and faceplates), see [Catalog IC 10, Chapter 14 "Parameterizing, Configuration and Visualization with SIRIUS"](#).

Configuration tool for ET 200S station

The "TIA Selection Tool" enables the fast and accurate selection of SIMATIC hardware. It is available as a configurator in the Siemens Industry Mall free of charge. Combine 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). You can transfer the parts list you receive to the Industry Mall shopping cart and place your order quickly, conveniently and with no problems.

You can find detailed information about the ET 200S system at:

www.siemens.com/ET200S

Here you will find a link to the TIA Selection Tool.

I/O systems

ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

General data



SIMATIC ET 200S

Standard motor starters

SIMATIC ET 200S

High Feature motor starters¹⁾

Device functions (firmware features)

Slave on the bus

Fieldbus ✓ Dependent on interface module

Parameterization

PROFIBUS/PROFINET data records -- ✓

Parameterization using data record start up -- ✓

Diagnosis

Acyclic through data records -- ✓

Diagnostic interrupt support ✓

Diagnostics using PROFIBUS/PROFINET -- ✓ See manual²⁾

Process image

Process image ✓ 3/30 ✓ 16/70

Address area required per module ✓ 4 bits ✓ 2 bytes

Data channels

Manual mode local interface -- ✓ Through module

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

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

Data records (acyclic)

Parameterization -- ✓

Support for PROFlenergy profile -- ✓ Measurement of motor current and disconnection in idle times

Diagnostics -- ✓

Measured values -- ✓

Statistics -- ✓

Commands -- ✓

Min/max pointer -- ✓

Logbook -- ✓

Device identification -- ✓

I&M data -- ✓

Inputs

Number ✓ 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 the process image -- ✓ 4

Input action ✓ End position on left, right ✓ Parameterizable: Flexible

Quick Stop -- ✓ Parameterizable

Outputs

Number ✓ Internal, for controlling the brake module

Output action ✓ Brake

Brake output with additional module

Motor brake voltage: brake 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 ✓ Solid-state, wide range 1:10

Overload warning -- Tripping only ✓

Short-circuit protection ✓ Motor starter protector ✓

Full motor protection --

Motor protection response in case of overload Thermal motor model response -- ✓ Parameterizable: disconnection without restart, disconnection with restart, warning

Automatic reset --

Temperature sensor --

Emergency start function -- (✓ with Control Unit 3RK1903-OCG00) ✓

✓ Function available

-- Function not available

¹⁾ The specified device functions apply in full only to the new -.AB4 starters.

²⁾ <http://support.automation.siemens.com/WWW/view/en/6008567>



SIMATIC ET 200S

SIMATIC ET 200S

Standard motor starters

High Feature motor starters

Device functions (firmware features)**Device functions**

Repair switch	✓	Rocker switch	✓	Motor starter protector
Motor starter protector signaling	✓		✓	Parameterizable
Lower current limit monitoring	--		✓	Parameterizable, increment 3.125 %, 18.75 ... 100 %
Upper current limit monitoring	--		✓	Parameterizable, increment 3.125 %, 50 ... 400 %
Zero current detection	--		✓	Parameterizable: warning, disconnection
Stall protection/disconnecting the blocking current	--		✓	Parameterizable
Asymmetry	✓		✓	Parameterizable: warning, disconnection
Load type	--		✓	Parameterizable: 1 and 3-phase
Tripping class	✓	CLASS 10	✓	Parameterizable for DS1e-x, RS1e-x: CLASS 5 (10a), 10, 15, 20 for DSS1e-x: CLASS 5 (10a), 10 (only at 0.3 ... 3 A)
Protection against voltage failure	✓		✓	Parameterizable: activated/deactivated

Local diagnostics functions using LEDs

"C-STAT" switching status	✓	Red/green/yellow LEDs		
"SF" group fault	✓	Red LEDs		
"DEVICE" device status	--		✓	Red/green/yellow LEDs
Auxiliary switches for enabling circuit of the ET 200S – safety technology already integrated (For use up to SIL 3 (IEC 61508) or PL e (EN ISO 13849-1) in combin. with infeed contactor)	--	Failsafe kit needed	✓	Except DSS1e-x (max. SIL 1 or PL b can be achieved)

✓ Function available

-- Function not available

ET 200S Standard motor starters

ET 200S High Feature motor starters

DS1-x, RS1-x

DS1e-x, RS1e-x

DSS1e-x

Device functions (firmware features)**Control function soft starter**

Soft start function	--		✓	
Bypass function	--			
Starting time	--		✓	Locally adjustable, not through bus 0 ... 20 s
Ramp-down time	--		✓	Locally adjustable, not through bus 0 ... 20 s
Ramp-down mode	--		✓	Locally adjustable, not through bus
Starting voltage	--		✓	Locally adjustable, not through bus 30 ... 100 % of U_e
Stopping voltage	--		✓	Locally adjustable, not through bus
Trace	--			

✓ Function available

-- Function not available

Technical specifications

	ET 200S Standard motor starters		ET 200S High Feature motor starters	
	DS1-x, RS1-x		DS1e-x, RS1e-x	DSS1e-x
Mechanics and environment				
Motor starters for connection to ET 200S, max.¹⁾		42		17
Mounting dimensions (W x H x D)				
• Direct-on-line starters	mm	45 x (265 + 45) x (120 + 27); (45: PE/N block; 27: auxiliary switch contactor from F-Kit)		65 x (290 + 45) x (150 + 23); (45: PE/N block; 23: control module)

I/O systems

ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

General data

		ET 200S Standard motor starters		ET 200S High Feature motor starters	
		DS1-x, RS1-x		DS1e-x, RS1e-x	DSS1e-x
• Reversing starters	mm	90 x (265 + 45) x (120 + 27); (45: PE/N block; 27: auxiliary switch contactor from F-Kit)		130 x (290 + 45) x (150 + 23); (45: PE/N block; 23: control module)	
Permissible ambient temperature					
• During operation	°C	0 ... +60, from +40 with derating		0 ... +60 for horizontal mounting up to +40	
• During storage	°C	-40 ... +70		-40 ... +70	
• Permissible mounting position	°C	Vertical, horizontal with derating		Vertical, horizontal	
Weight					
• Direct-on-line/reversing starters incl. terminal module	kg	1.0/1.6		1.6/2.2	
• Direct-on-line/revers. starters incl. terminal block PE/N		1.1/1.8		1.7/2.3	
Vibration resistance acc. to IEC 60068, parts 2-6	g	2			
Shock resistance acc. to IEC 60068, parts 2-27	g/ms	Square 5/11			
Conductor cross-section					
• Solid	mm ²	2 x (1 ... 2.5) ² ; 2 x (2.5 ... 6) ² , according to IEC 60947: max. 1 x 10			
• Finely stranded with end sleeve	mm ²	2 x (1 ... 2.5) ² ; 2 x (2.5 ... 6) ²			
• AWG cables, solid or stranded	AWG	2 x (14 ... 10)			
Degree of protection					
IP20, finger-safe (also applies to terminal modules on a dismantled motor starter)					
Mechanical endurance					
• Motor starter protector	Oper- ating cycles	100 000		10 million	
• Contactors		30 million		--	
• Contactors with safety function (F-Kit)		10 million		--	
Electrical specifications					
Current consumption					
• From auxiliary circuit L+/M (U ₁)	mA	Approx. 20		Approx. 40	
• From auxiliary circuit A1/A2 (U ₂)	mA	Approx. 100		Approx. 1 700 (80 ms long), approx. 350 (after 80 ms)	
Rat. operat. current for terminal modules TM-D I_e					
	A	40		50	
Rated operational voltage U_e					
	V	400			
Approval DIN VDE 0106, part 101					
	V	Yes, up to 500		Yes, up to 480	
CSA and U_i approval					
	V	Yes, up to 600		Yes, up to 480	
Rated operational current I_e for motor starters					
• AC-1/2/3 at 60 °C					
- At 400 V	A	12		16	
- At 500 V	A	9		11	
• AC-4 at 60 °C					
- At 400 V	A	4.1		9	
Rated short-circuit breaking capacity					
	kA	50 at 400 V			
Power of three-phase 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, according to DIN VDE 0106, part 101			
Positively-driven operation of contactor relay (NC)					
		Yes		--	
Trip class					
		CLASS 10		Parameterizable CLASS 5 (10 A), 10, 15, 20	
				0.3 ... 3 A: CLASS 10/10A, parameterizable; 2.4 ... 8 A: CLASS 10A 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	
Electrical endurance					
• Motor starter protector	h	100 000		--	
• Contactors		See manual ³⁾			
Permissible switching frequency with starting time					
t_A = 0.1 s and relative ON period t_{ED} = 50 %	1/h	< 80		See manual ³⁾	
Induction protection					
		Already installed			

¹⁾ Additional limits: process image, max. design width 2 m.

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

³⁾ <http://support.automation.siemens.com/WWW/view/en/6008567>

More information

Notes on safety

System networking requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation.

More information on the subject of Industrial Security, see www.siemens.com/industrialsecurity.

Overview

Functionality of the Standard motor starters

- For basic functionality see "General data" → "Overview", page 9/216
- Direct-on-line and reversing starters up to 5.5 kW
- Power bus up to 40 A
- With motor starter protector and contactor assembly
- Integrated isolating function via motor starter protector
- Can be combined with local safety technology for use in safety-related system components with F-Kit and PM-D F modules (see "Accessories" → "Overview", page 9/243)

Device functions (firmware features)

See "General data" → "Overview", page 9/218

Technical specifications

See "General data" → "Technical specifications", page 9/219

Selection and ordering data

Motor rating three-phase motor 4-pin at 400 V AC, standard output P kW	Setting range of the overcurrent release A	Article No.
---	---	-------------

Standard motor starters,
with diagnostics, electromechanical, fuseless,
expandable with brake control module



DS1-x

Direct starter DS1-x

< 0.06	0.14 ... 0.20	3RK1301-0BB00-0AA2
0.06	0.18 ... 0.25	3RK1301-0CB00-0AA2
0.09	0.22 ... 0.32	3RK1301-0DB00-0AA2
0.10	0.28 ... 0.40	3RK1301-0EB00-0AA2
0.12	0.35 ... 0.50	3RK1301-0FB00-0AA2
0.18	0.45 ... 0.63	3RK1301-0GB00-0AA2
0.21	0.55 ... 0.80	3RK1301-0HB00-0AA2
0.25	0.70 ... 1.00	3RK1301-0JB00-0AA2
0.37	0.90 ... 1.25	3RK1301-0KB00-0AA2
0.55	1.1 ... 1.6	3RK1301-1AB00-0AA2
0.75	1.4 ... 2.0	3RK1301-1BB00-0AA2
0.90	1.8 ... 2.5	3RK1301-1CB00-0AA2
1.1	2.2 ... 3.2	3RK1301-1DB00-0AA2
1.5	2.8 ... 4.0	3RK1301-1EB00-0AA2
1.9	3.5 ... 5.0	3RK1301-1FB00-0AA2
2.2	4.5 ... 6.3	3RK1301-1GB00-0AA2
3.0	5.5 ... 8.0	3RK1301-1HB00-0AA2
4.0	7 ... 10	3RK1301-1JB00-0AA2
5.5	9 ... 12	3RK1301-1KB00-0AA2



RS1-x

Reversing starter RS1-x

< 0.06	0.14 ... 0.20	3RK1301-0BB00-1AA2
0.06	0.18 ... 0.25	3RK1301-0CB00-1AA2
0.09	0.22 ... 0.32	3RK1301-0DB00-1AA2
0.10	0.28 ... 0.40	3RK1301-0EB00-1AA2
0.12	0.35 ... 0.50	3RK1301-0FB00-1AA2
0.18	0.45 ... 0.63	3RK1301-0GB00-1AA2
0.21	0.55 ... 0.80	3RK1301-0HB00-1AA2
0.25	0.70 ... 1.00	3RK1301-0JB00-1AA2
0.37	0.90 ... 1.25	3RK1301-0KB00-1AA2
0.55	1.1 ... 1.6	3RK1301-1AB00-1AA2
0.75	1.4 ... 2.0	3RK1301-1BB00-1AA2
0.90	1.8 ... 2.5	3RK1301-1CB00-1AA2
1.1	2.2 ... 3.2	3RK1301-1DB00-1AA2
1.5	2.8 ... 4.0	3RK1301-1EB00-1AA2
1.9	3.5 ... 5.0	3RK1301-1FB00-1AA2
2.2	4.5 ... 6.3	3RK1301-1GB00-1AA2
3.0	5.5 ... 8.0	3RK1301-1HB00-1AA2
4.0	7 ... 10	3RK1301-1JB00-1AA2
5.5	9 ... 12	3RK1301-1KB00-1AA2

I/O systems

ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

Standard terminal modules

Overview

Terminal modules **TM-DS, TM-RS**

More information see also "General data" → "Overview" → from the section "Power supply through terminal modules", page 9/216.

- "-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", page 9/246)
- 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 between two DS1-x motor starters (see "Accessories", page 9/244).

Technical specifications

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

		TM-DS45	TM-DS65/TM-FDS65
Dimensions			
• 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
Rated voltages, currents and frequencies for the power bus			
• Rated insulation voltage U_i	V	690	
• Rated operational voltage U_e	V AC	500	
• Rated impulse withstand voltage U_{imp}	kV	6	
• Rated operational current I_e	A	40	50
• Rated frequency	Hz	50/60	
Conductor cross-sections			
• Solid	mm ²	2 x (1 ... 2.5) ¹⁾ or 2 x (2.5 ... 6) ¹⁾	
• Finely stranded with end sleeve	mm ²	1 x 10 or 2 x (1 ... 2.5) ¹⁾ or 2 x (2.5 ... 6) ¹⁾ according to IEC 60947	
• AWG cables, solid or stranded	AWG	2 x (14 ... 10)	
• With additional three-phase infeed terminal if required			
- Solid or stranded	mm ²	1 x 2.5 ... 25	
- Finely stranded with end sleeve	mm ²	1 x 2.5 ... 25	
- AWG cables, solid or stranded	AWG	1 x 12 ... 4	
Wiring			
• Required tool		Standard screwdriver size 2 and Pozidriv 2	
• Tightening torque	Nm	2.0 ... 2.5	




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

TM-RS90 and TM-RS130/TM-FRS130 terminal modules

		TM-RS90	TM-RS130/TM-FRS130
Dimensions			
• 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
Rated voltages, currents and frequencies for the power bus			
• Rated insulation voltage U_i	V	690	
• Rated operational voltage U_e	V AC	500	
• Rated impulse withstand voltage U_{imp}	kV	6	
• Rated operational current I_e	A	40	50
• Rated frequency	Hz	50/60	

	TM-RS90	TM-RS130/TM-FRS130
Conductor cross-sections		
• Solid	mm ²	2 x (1 ... 2.5) ¹⁾ or 2 x (2.5 ... 6) ¹⁾
• Finely stranded with end sleeve	mm ²	1 x 10 or 2 x (1 ... 2.5) ¹⁾ or 2 x (2.5 ... 6) ¹⁾ according to IEC 60947
• AWG cables, solid or stranded	AWG	2 x (14 ... 10)
• With additional three-phase infeed terminal if required		
- Solid or stranded	mm ²	1 x 2.5 ... 25
- Finely stranded with end sleeve	mm ²	1 x 2.5 ... 25
- AWG cables, solid or stranded	AWG	1 x 12 ... 4
Wiring		
• Required tool		Standard screwdriver size 2 and Pozidriv 2
• Tightening torque	Nm	2.0 ... 2.5
1) If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified. If identical cross-sections are used, this restriction does not apply.		

Selection and ordering data

Version	Article No.
Terminal modules for Standard motor starters	
 3RK1903-0AB00	TM-DS45-S32 for DS1-x direct-on-line starters with incoming power bus connection including three caps for terminating the power bus 3RK1903-0AB00
 3RK1903-0AB10	TM-DS45-S31 for DS1-x direct-on-line starters without incoming power bus connection 3RK1903-0AB10
 3RK1903-0AC00	TM-RS90-S32 for RS1-x reversing starters with incoming power bus connection including three caps for terminating the power bus 3RK1903-0AC00
	TM-RS90-S31 for RS1-x reversing starters without incoming power bus connection 3RK1903-0AC10

I/O systems

ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

High Feature motor starters

Overview

Functionality of the High Feature motor starters

- For basic functionality see "General data" → "Overview", page 9/216.
- Direct-on-line, reversing or soft starters up to 7.5 kW
- With wide range in 3 setting ranges, with 0.3 to 3 A, 2.4 up to 8 A, 2.4 to 16 A available
- With combination of starter circuit breaker, electronic overload protection (parameterizable), and contactor or soft starter
- Power bus up to 50 A
- Upper and lower current limits for plant and process monitoring
- Motor stall protection, zero current detection and asymmetry detection integrated
- The actual motor current is measured and transmitted for diagnostics in the cycle process image
- Control of the motor starter from the control system and extensive diagnostics status via the cyclic process image
- Optional digital inputs available in the cyclic process image and flexibly assignable with functions for adaptation to all applications
- Integrated isolating function using starter circuit breakers
- Detection of the switching state of the starter circuit breaker via auxiliary switches and of the contactor via current evaluation
- Local safety engineering possible (without F-kit in the case of the HF starter, because the function of the failsafe kit is already integrated)
- Front-mounting 2DI LC COM control module for another 2 parameterizable digital inputs
- Optional "Motor Starter ES" software for easy commissioning and diagnostics (see Chapter 14 "Parameterization, Configuration and Visualization with SIRIUS" in Catalog IC 10)
- PROFinergy capable
- Supplying the motor current in PROFinergy format and shutting down in dead times
- Support of all DPV1 acyclic services on PROFIBUS and PROFINET
 - Changing of parameters during operation, e.g. the rated operational current
 - Reading and writing acyclic data for exact diagnostics of the unit or process and for analysis of the plant status

Selective protection concept for ET 200S High Feature motor starters

As the result of the selective protection concept (separate tripping of short circuit and overload) with electronic overload evaluation, additional advantages are realized on the High Feature motor starters – advantages which soon make themselves positively felt particularly in manufacturing processes with high plant stoppage costs:

- Only two versions up to 7.5 kW – hence little order variance and stock keeping
- All settings can be parameterized by bus – hence full TIA capability
- Separate signaling of overload and short circuit – enables selective diagnostics
- Overload can be acknowledged by remote reset – ideal for highly automated plants
- Current asymmetry monitoring – complete monitoring of the motor
- Stall protection – complete monitoring of the motor
- Emergency start function in case of overload – operation is possible in an emergency

- Current value transmission via bus – monitoring of the application
- Current limit monitoring
- Trip class can be parameterized – overload tripping can be adapted to the application
- Type of coordination "2" – still functional after short circuit with magnitude of 50 kA
- Very high contact endurance



ET 200S High Feature motor starters: DS1e-x direct-on-line starter



ET 200S High Feature motor starters: DSS1e-x direct-on-line soft starter



ET 200S High Feature motor starters: RS1e-x reversing starters

High Feature motor starters

PROFenergy for ET 200S High Feature motor starters¹⁾

Increasing energy prices, far-reaching ecological problems worldwide and the threat of climate change make it necessary for you to be more conscious about your use of energy.

Active and effective energy management is possible with PROFenergy.

PROFenergy is a manufacturer-independent profile on PROFINET, which can be used by all manufacturers, has been standardized by PNO¹⁾ and supports shutting down electrical devices during dead times and reading out measured values.

The ET 200S HF motor starter supplies the motor current in PROFenergy format and switches off during dead times.

Support of all acyclic services on PROFIBUS and PROFINET

Thanks to the acyclic services, the ET 200S HF motor starters now offer plenty of diagnostics data via data records. There are new extensive options for reading out data from the motor starter for monitoring devices, systems or processes. The motor starter is equipped internally with three logbooks for device faults, motor starter trips and events, which are issued with a time stamp. These logbooks can be read out of the motor starter on demand at any time and provide the plant operator with plenty of information about the state of his plant and process which he can use to carry out improvements.

With the min/max pointer and statistical data functions it is possible to read out, for example, the maximum internal current values or the number of motor starter connection operations. This allows deviations in the process to be monitored, but also optimum initial commissioning to take place.

Statistical data or measured values make plant monitoring easy for the user.

The device diagnostics data record contains details of all the states of the motor starter, the device configuration and the communication status as a basis for central device and plant monitoring.

The Installation and Maintenance functions (I&M) store, firstly, information (I&M) about the modules used in the motor starter and, secondly, data (I&M) that can be defined during configuration, e.g. location designations. I&M functions are used for troubleshooting faults and localizing changes in hardware at a plant or checking the system configuration.

Supported data records:

- DS 0 S7-V1 system diagnostics (S7 diagnostics alarm)
- DS 72, 73, 75 logbooks, device faults, trips, 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 (= equipment identifier)
- DS 233 I&M 2 (= installation)
- DS 234 I&M 3 (= description)

Device functions (firmware features)


See "General data" → "Overview", page 9/218

¹⁾ In the PNO (PROFIBUS Nutzerorganisation e. V. – PROFIBUS User Organization), manufacturers and users have come together to agree on the standardized PROFIBUS and PROFINET communication technologies.

Technical specifications

See "General data" → "Technical specifications", page 9/219

Selection and ordering data**High Feature motor starters in fully innovated design ("-.AB4 starters")¹⁾**

	Setting range of the overcurrent release A	Article No.
 DS1e-x High Feature motor starters, with diagnostics, electronic overload protection, fuseless, expandable with brake control module	DS1e-x direct-on-line starter	
	0.3 ... 3	3RK1301-0AB10-0AB4
	2.4 ... 8	3RK1301-0BB10-0AB4
	2.4 ... 16	3RK1301-0CB10-0AB4
	RS1e-x reversing starters	
	0.3 ... 3	3RK1301-0AB10-1AB4
	2.4 ... 8	3RK1301-0BB10-1AB4
	2.4 ... 16	3RK1301-0CB10-1AB4
	DSS1e-x direct-on-line soft starter	
	0.3 ... 3	3RK1301-0AB20-0AB4
	2.4 ... 8	3RK1301-0BB20-0AB4
	2.4 ... 16	3RK1301-0CB20-0AB4

¹⁾ When a device is replaced, the innovated motor starter will behave like a not yet innovated motor starter ("-.AA4 starter"), i.e. it will run in DPV0 mode.

I/O systems

ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

High Feature terminal modules

Overview

Terminal modules *TM-DS, TM-RS*


More information see also "General data" → "Overview" → from the section "Power supply through terminal modules", page 9/216.

- "-S32" version with incoming connection: 2 x 3 x 10 mm² screw terminals for power bus and motor feeder
- "-S31" version without incoming connection: 1 x 3 x 10 mm² screw terminals for motor feeder
- Optionally expandable with PE/N modules (see "Accessories", page 9/246)

Technical specifications

See "Standard terminal modules" → "Technical specifications", page 9/222.

Selection and ordering data

Version	Article No.
Terminal modules for High Feature motor starters	
 <p>TM-DS65-S32 for DS1e-x and DSS1e-x direct-on-line starters with incoming power bus connection including three caps for terminating the power bus</p>	3RK1903-0AK00
<p>TM-DS65-S31 for DS1e-x and DSS1e-x direct-on-line starters without incoming power bus connection</p>	3RK1903-0AK10
<p>TM-RS130-S32 for RS1e-x reversing starters with incoming power bus connection including three caps for terminating the power bus</p>	3RK1903-0AL00
<p>TM-RS130-S31 for RS1e-x reversing starters without incoming power bus connection</p>	3RK1903-0AL10

3RK1903-0AK00

Overview

- Disconnection of a complete group of motor starters is possible without any additional outlay (PL b according to ISO 13849-1 or SIL 1 according to IEC 62061)
- 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 unit actuation enables the entire group to be shut down while maintaining the diagnostics capability.

Technical specifications

		PM-D power module 3RK1903-0BA00
Rated control supply voltage U_s up to 60 °C	V	20.4 ... 28
Rated operational current I_e		
• Recommended short-circuit protection	A	10
• Melting fuse	A	10
• Miniature circuit breaker	A	10, tripping characteristic B
Power consumption from backplane bus	mA	≤ 10
Supply of		
• Motor starters		Yes
• Frequency converters		Yes
• Motor starters for safety technology		No
• Electronic modules		No
• Ex(i) modules		No
Alarms		None
Diagnostic functions		Yes
• System fault/device fault		Red "SF" LED
• Monitoring of the electronics power supply U_1		Green "PWR" LED
• Monitoring of the supply voltage for contactors U_2		Green "CON" LED
• Diagnostics information can be read out		Yes
Conductor cross-sections		
• Flexible with end sleeve	mm ²	1.5
• Rigid	mm ²	2.5
Mounting dimensions (W x H x D)	mm	15 x 195.5 x 117.5

Selection and ordering data

Version	Article No.
Power module	
 <p>PM-D power module for 24 V DC with diagnostics</p>	3RK1903-0BA00

3RK1903-0BA00

I/O systems

ET 200 systems for the control cabinet

ET 200S - Motor starters and Safety motor starters

Power module terminal modules


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.

Selection and ordering data

Version	Article No.	
Terminal module for power module		
 <p>3RK1903-0AA00</p>	<p>TM-P15 S27-01 terminal module for PM-D power module</p> <p>3RK1903-0AA00</p>	<p>1</p>

Overview



ET 200S Failsafe motor starters: F-DS1e-x direct-on-line starter

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

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 safety-related manner. The second redundant shut-down 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 Failsafe motor starters are characterized by easy, space-saving assembly as well as minimal wiring outlay. Like the High Feature starters, the Failsafe 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 Failsafe motor starter is predestined for use in combination with PROFIsafe (see connection diagram "ET 200S Safety Motor Starter Solution PROFIsafe with Failsafe motor starters", page 9/237). Another field of application is in combination with ASIsafe or safety relays (see Example 2, page 9/235).

High degree of flexibility with safety technology

Solution PROFIsafe 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 Failsafe contact multiplier with four floating contacts.

Solution local with PM-D FX1

Failsafe motor starters with safety relay (version 1) or ASIsafe (version 2, see example 2, page 9/235): 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 Failsafe motor starters which then selectively switch off the downstream motors.

Benefits

Advantages over conventional safety technology

- Significant savings in components (less hardware)
- Less mounting and installation work
- Motor starters are fail-safe and offer high availability

Technical specifications

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

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


I/O systems

ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

ET 200S Failsafe motor starters

		F-DS1e-x direct-on-line starters	F-RS1e-x reversing starters
Voltages, currents, potentials			
Switching capacity		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	
Status, alarms, diagnostics			
Status display		SF, DEVICE and C-STAT, SG1 ... SG6	
Diagnostic functions		Red LED (SF)	
• Group fault display		Possible	
• Diagnostics information can be read out			
Control circuit			
Rated operational voltage for electronics U_1	V DC	24 (20.4 ... 28.8)	24 (21.6 ... 26.4)
Reverse polarity protection for electronics U_1		Yes	
Rated operational voltage for contactor U_2	V DC	24 (20.4 ... 28.8)	
Reverse polarity protection for contactor U_2		Yes	
Current consumption			
• 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 to 6			
- Pickup	mA	250 (for 200 ms)	
- Hold	mA	Max. 55	
• Test function of the shunt release/starter circuit breaker (50 ms) from U_1	A	Approx. 1.5	
• From the backplane bus	mA	Approx. 20	
Main circuit			
Rated operational voltage U_e			
• Acc. to DIN VDE 0106, part 1014, IEC 60947-1, EN 60947-1	V AC	500	
• Protective separation between main and auxiliary circuits	V	400	
• UL, CSA	V AC	600	
Rated insulation voltage U_i	V AC	500	
Rated impulse withstand voltage U_{imp}	kV	6	
Rated frequency	Hz	50/60	

Selection and ordering data

		Setting range of the overcurrent release	Article No.
		A	
ET 200S Failsafe motor starters			
	F-DS1e-x direct-on-line starters		
	Failsafe direct-on-line starters up to 7.5 kW at 400 V AC		
	Mechanically switching		
	Electronic overload protection		
	• 0.3 ... 3		
	• 2.4 ... 8		
• 2.4 ... 16			
F-RS1e-x reversing starters			
Failsafe reversing starters up to 7.5 kW at 400 V AC			
Mechanically switching			
Electronic overload protection, fuseless			
• 0.3 ... 3			
• 2.4 ... 8			
• 2.4 ... 16			
			3RK1301-0AB13-0AA4
			3RK1301-0BB13-0AA4
			3RK1301-0CB13-0AA4
			3RK1301-0AB13-1AA4
			3RK1301-0BB13-1AA4
			3RK1301-0CB13-1AA4

F-DS1e-x
direct-on-line starters

Selection and ordering data

Version	Article No.
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Terminal modules for Failsafe motor starters



3RK1903-3AC00

TM-FDS65-S32-01/S31-01 terminal modulesfor F-DS1e-x direct-on-line starters
with coding

- With incoming power bus connection (TM-FDS65-S32-01)
- Without incoming power bus connection (TM-FDS65-S31-01)

3RK1903-3AC00**3RK1903-3AC10****TM-FRS130-S32-01/S31-01 terminal modules**for F-RS1e-x reversing starter
with coding

- With incoming power bus connection (TM-FRS130-S32-01)
- Without incoming power bus connection (TM-FRS130-S31-01)

3RK1903-3AD00**3RK1903-3AD10**

I/O systems

ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

Safety modules local and PROFIsafe

Overview

ET 200S Safety Motor Starter Solutions local/PROFIsafe

The ET 200S Safety Motor Starter Solutions are preferred in all production and process automation fields in which the enhancement of plant availability and flexibility play a key role.

- ET 200S Safety Motor Starters Solutions local are preferred from the safety technology point of view for locally restricted safety applications. These motor starters are not dependent on a safe control system.
- ET 200S Safety Motor Starters Solutions PROFIsafe, on the other hand, are often found in safety applications of the more complex type that are interlinked. In this case a safe control system is used with the PROFINET or PROFIBUS bus systems with the PROFIsafe profile.

The ET 200S Safety Motor Starter Solutions comprise:

- Safety modules ([page 9/233](#))
- Standard motor starters ([page 9/221](#))
- High Feature motor starters ([page 9/224](#))
- Failsafe motor starters ([page 9/229](#))

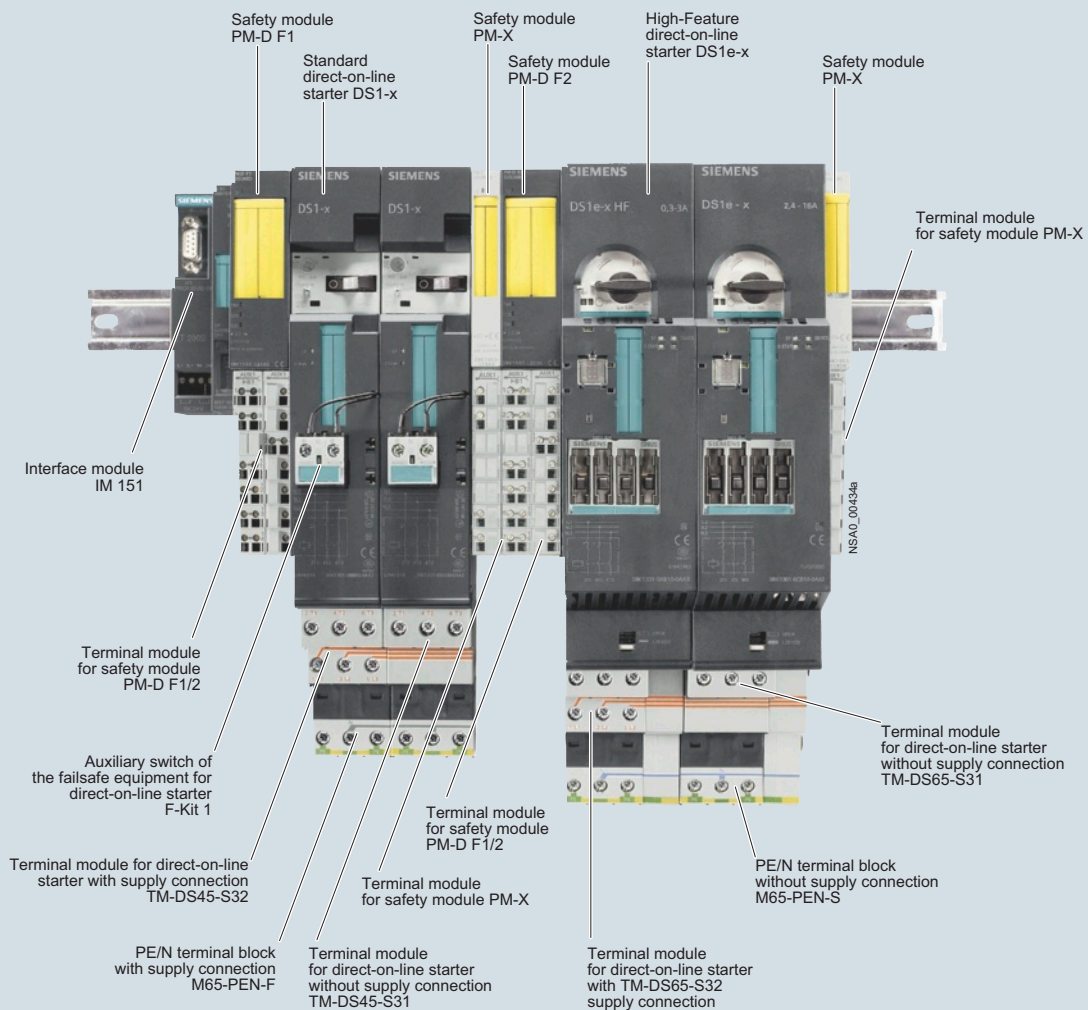
With the ET 200S Safety Motor Starter Solution local there is no complicated and hence cost-intensive configuring and wiring

ET 200S Safety Motor Starter Solution local

compared to conventional safety systems. The ET 200S Safety Motor Starter Solutions local are designed for PL e according to ISO 13849-1 or SIL 3 IEC 62061.

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

Within an ET 200S station, the Safety Motor Starter Solutions local can also be combined with Standard motor starters or High Feature motor starters without safety functions up to max. 4 kW up to PL d according to ISO 13849-1 or SIL 2 according to IEC 62061.



Interaction of ET 200S Safety Motor Starter Solutions local components

Components for ET 200S Safety Motor Starter Solution local

The ET 200S Safety Motor Starter Solutions local comprise:

Version 1 (see example 1, page 9/235):

- Safety modules PM-D F1 ... 5
- PM-X module
- Standard motor starter or High Feature motor starter

Version 2 (see example 2, page 9/235):

- PM-D FX1 safety module
- Failsafe motor starters

Functionality of the ET 200S Safety Motor Starter Solution local

- For using Standard, High Feature or Failsafe motor starters in systems with safety category SIL 1 (according to IEC 62061) or PL c to PL e (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 onto the TM-PF30 terminal modules

With Safety Motor Starter Solutions local the highest safety category can be achieved according to ISO 13849-1 and IEC 62061. They can thus be used for evaluation of EMERGENCY STOP circuits or for monitoring protective doors and also for time-delayed disconnections. With the contact multiplier the safety-relevant signals can also be made available to external systems.

All standard safety applications can be covered by combining of different TM-PF30 terminal modules. Needless to say, ET 200S motor starters can also be used in conjunction with external safety relays or with ASIsafe.

With the Safety Motor Starter Solutions local, up to 80 % of wiring is saved compared to conventional safety systems with local safety applications.

With the Safety Motor Starter Solutions local it is easy to configure several safety circuits. The safety sensors are connected directly and locally to the safety modules. These safety modules perform the work of the otherwise obligatory safety relays and safely shut down the downstream motor starters in accordance with the function selected. The crosslinks required for this are already integrated in the system and need no additional wiring. All signals from the safety modules are automatically relayed as diagnostic signals, e.g. in the event of 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, as are the auxiliary voltages.

Safety-relevant system signals, e.g. due to an actuated EMERGENCY STOP switch or a missing auxiliary voltage, are automatically generated and notified to the interface module. The latter assigns an unambiguous ID to the fault. Using the PROFIBUS DP diagnostics block, faults of this type can be identified and localized without a great deal of programming work.

PM-D F1/F2/F3/F4/F5 safety modules

- PM-D F1/F2/F3/F4/F5 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 expanding safety circuits with other ET 200S motor starters, e.g. in a different tier
 - PM-D F5: Transmits the status from PM-D F1 ... 4 via four floating enabling circuits to external safety devices (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-X¹⁾.
- 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 each¹⁾.

¹⁾ See "Accessories for Safety modules local", page 9/247.



PM-D F1 safety module

PM-D FX1 safety module

The PM-D FX1 safety module is used for feeding in 1 to 6 switch-off groups. The infeed voltage can be switched using 1 to 6 external safety shutdown devices (either ASIsafe monitors or 3TK28 safety relays). This safety module is used in applications with external safety shutdown devices where there is a need for the fully selective safety shutdown of Failsafe motor starters/frequency converters (see example 2, page 9/235).

Terminal modules for (TM-PF30) safety module

For feeding 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 configuring of separate safety circuits or for the cascading of safety circuits, and for applications with time-delayed disconnection (see page 9/241).

I/O systems

ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

Safety modules local and PROFIsafe

Terminal module (TM-X)

For connection of an external infeed contactor (2nd shutdown possibility), with terminals for the contactor coil and feedback contact, this module is always required to terminate a group of safety-related motor starters.

Failsafe Kit

The Failsafe 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, and F-Kit 2 supplements 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 requirement

Components needed	Maximum achievable safety integrity according to ISO 13849-1 or IEC 62061				
	ISO 13849-1	PL b/c	PL c	PL d ¹⁾	PL d / PL e ¹⁾
	IEC 62061	SIL 1	SIL 1	SIL 2	SIL 3
PM-D		✓	--	--	--
PM-D F1/-F2/-F4		--	✓	✓	✓
PM-D F3		--	✓	✓	--
Failsafe kit 1/failsafe kit 2		--	✓ ²⁾	✓ ²⁾	✓ ²⁾
PM-X		--	✓	✓	✓
PM-D FX1		--	✓	✓	✓

✓ Required

-- Not required

¹⁾ An external infeed contactor is required in the main circuit (2-channel capability).

²⁾ F-Kit is only required for the Standard motor starter; it is already integrated in the High Feature motor starter.

Possible combinations of safety and terminal modules

Terminal modules	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	--	--	--	--	--	--	--	✓

✓ Possible

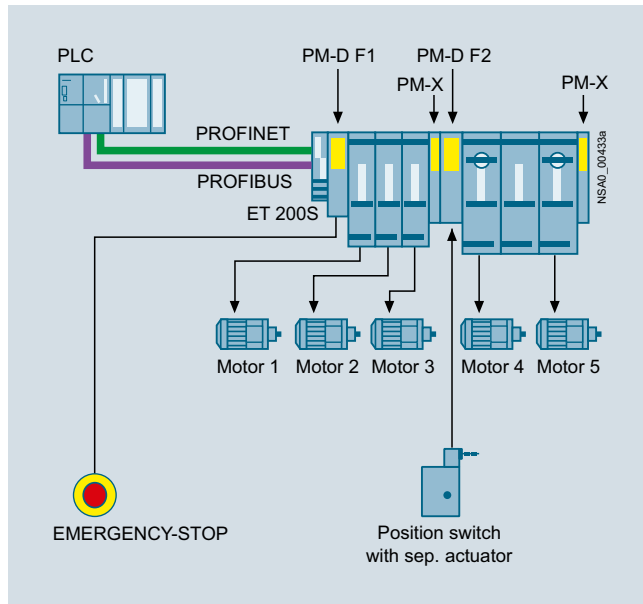
-- Not possible

Examples

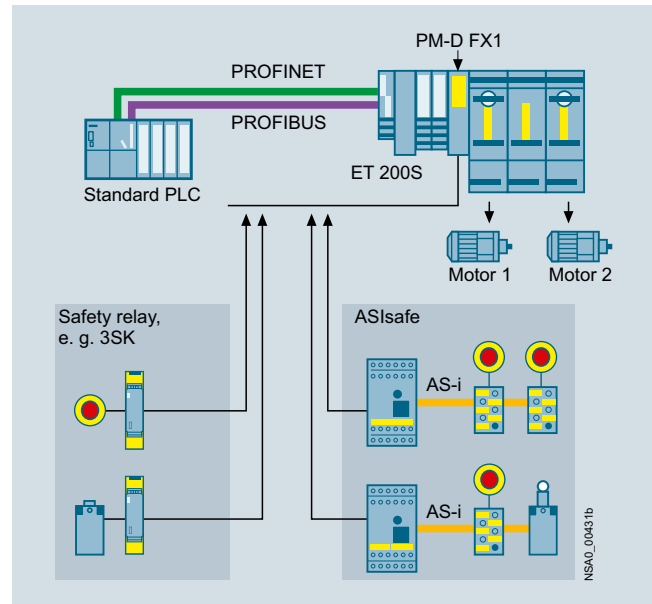
The diverse possible uses of the Safety Motor Starter Solutions local are presented in the manual SIMATIC ET 200S Motor Starters in the context of typical sample applications.

Safety functional examples for easy, quick and low-cost implementations of applications with Safety Motor Starter Solutions local are available on the Internet:

More information can be found on the Internet at:
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 combinations (= safety relays or ASIsafe monitors) and with Failsafe motor starters (PM-DFX1 application). 2 of the 6 available safe switch-off groups are used.

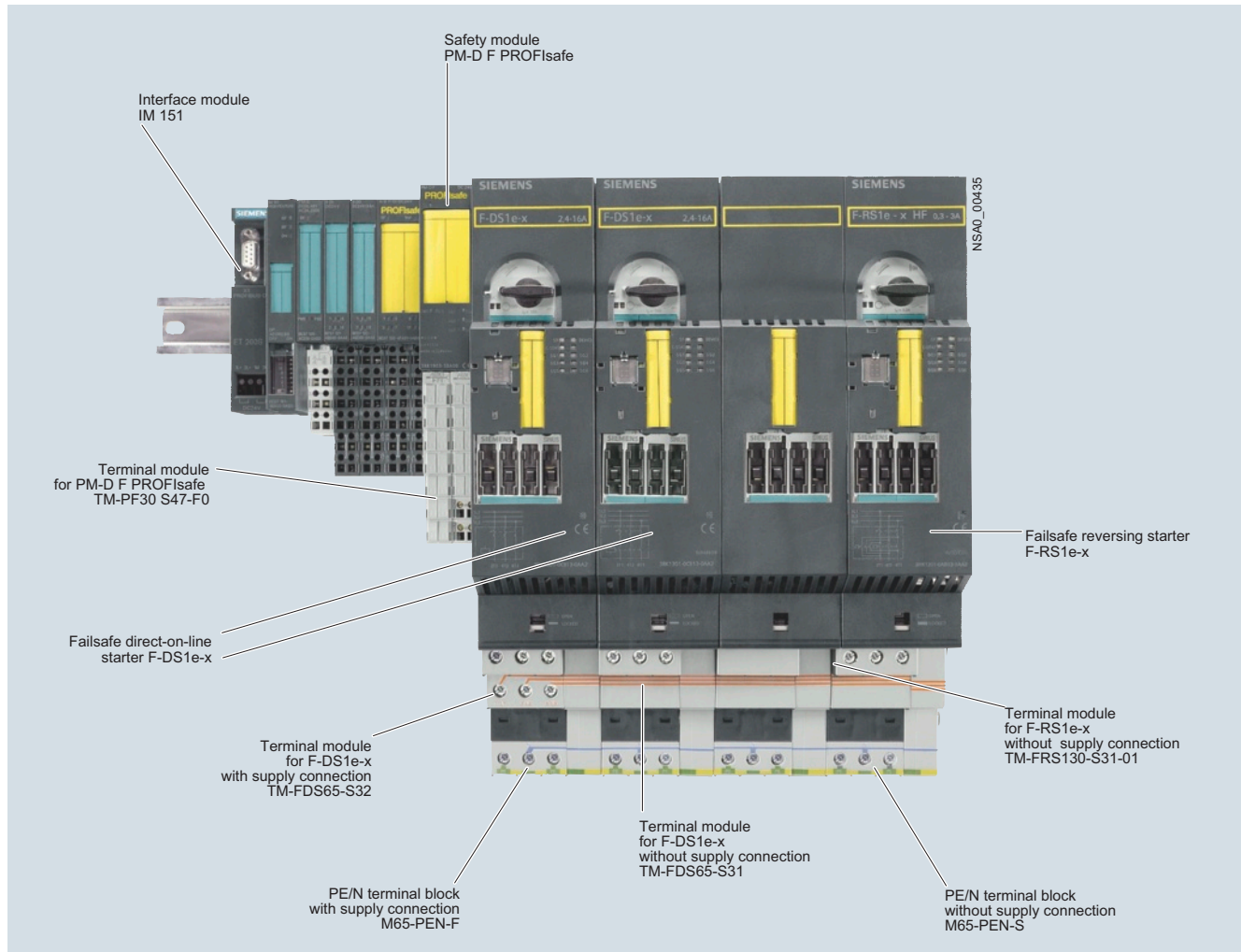
Signals with relevance for safety can be input to ET 200S through a PM-DFX1 infeed terminal module through the enabling circuits of the ASIsafe monitor or the safety relay to control the Failsafe motor starters which then selectively switch off the downstream motors.

I/O systems

ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

Safety modules local and PROFIsafe

ET 200S Safety Motor Starter Solution PROFIsafe



Interaction of ET 200S Safety Motor Starter Solution PROFIsafe components

Components for Safety Motor Starter ET 200S Solution PROFIsafe

The ET 200S Safety Motor Starter Solutions PROFIsafe consist of (see example, page 9/237):

- PMD F PROFIsafe safety modules
- Failsafe motor starters
- Safe control system with the PROFINET or PROFIBUS bus systems and the PROFIsafe profile

Functionality of the ET 200S Safety Motor Starter Solution PROFIsafe

- For the use of Failsafe motor starters in plants with PL c to PL e according to ISO 13849-1 and SIL 2 and 3 according 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 Failsafe motor starters
- No complex wiring for conventional safety systems, e.g. no infeed 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-related PROFIsafe communication and the use of a safety-related 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.

High degree of flexibility with safety technology Failsafe motor starters for PROFIsafe

In EMERGENCY STOP applications, the Failsafe 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 Failsafe freely-programmable logic of the SIMATIC controller is used to interface with the relevant Failsafe sensor technology.

F-CM contact multipliers

The interface between PROFIsafe and installations that use conventional safety technology is implemented through the F-CM Failsafe contact multiplier with four floating contacts.

PM-D F PROFIsafe safety module

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 safety shutdown of Failsafe motor starters/frequency converters.

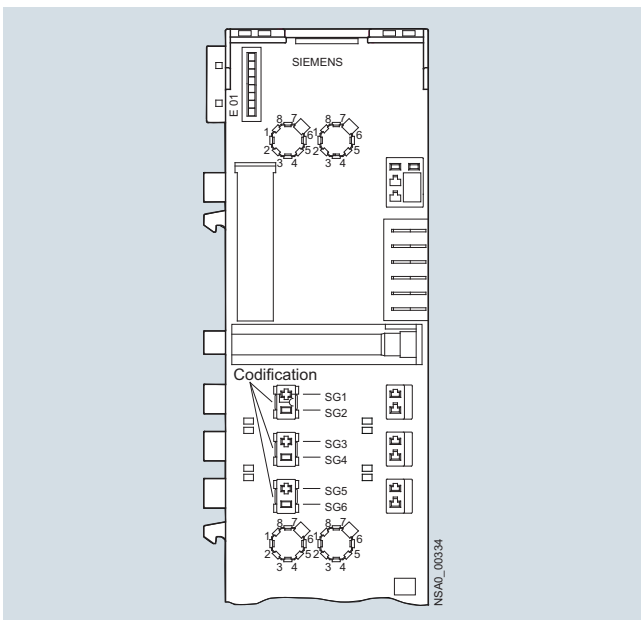


PM-D F PROFIsafe with TM-PF30 S47-F0 terminal module

Terminal modules

The terminal assignment of the terminal modules for safe motor starters corresponds to the terminal assignment of the 45 mm 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 as-delivered 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).



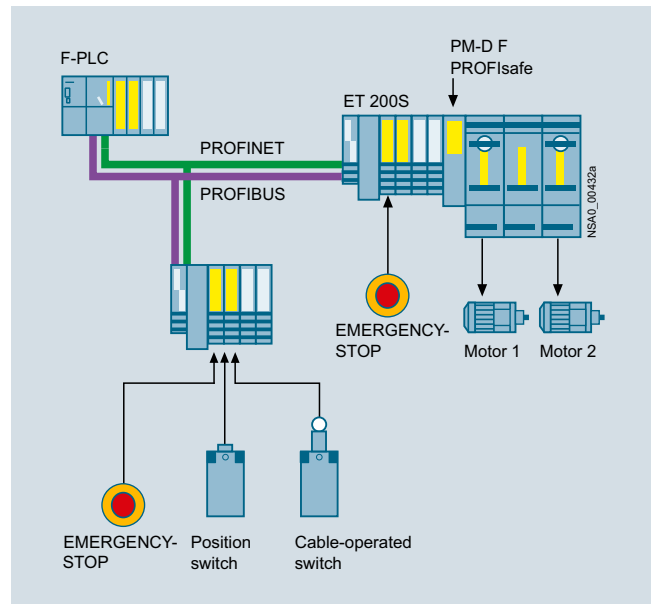
The Failsafe motor starters are assigned to one of the six possible switch-off groups.

Example:

The diverse possible uses of the Safety Motor Starter Solutions PROFIsafe are presented in the SIMATIC ET 200S Motor Starters manual in the context of typical sample applications.

Safety functional examples for easy, quick and low-cost implementations of applications with Safety Motor Starter Solution PROFIsafe are available on the Internet:

More information can be found on the Internet at:
www.siemens.com/ET200S



ET 200S Safety Motor Starter Solution PROFIsafe with Failsafe motor starters and fully selective disconnection (PM-DF PROFIsafe application)

Within an ET 200S station the Failsafe 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-related control system through 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-related SIMATIC CPU is used, the ET 200S is available as a safety-related I/O. 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 Failsafe 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 widespread plants or with sporadic demand for changes in the assignment of safety segments.

The Safety Motor Starter Solutions PROFIsafe are ideally suited for safety concepts with Cat. 2 to 4 according to ISO 13849-1 and up to SIL 3 according to IEC 62061.

Each safety module switches up to 6 switch-off groups for Failsafe motor starters/frequency converters.

I/O systems

ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

Safety modules local and PROFIsafe

Technical specifications

Safety modules PM-D F1, F2, F3, F4 and F5		
Mechanical endurance	Operating cycles	10 x 10 ⁶
Electrical endurance	Operating cycles	200 000 at I_e
Utilization category		DC-13
Control times		
• Minimum command duration	ms	200
• Recovery time	s	< 1
• OFF-delay	ms	30
Control circuit U_1		
• Rated control supply voltage U_s	V DC	24
• 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)
Switched auxiliary circuit U_2		
• Rated control supply voltage U_s	V DC	24
• 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
Recommended short-circuit protection for enabling and signaling circuits		Fuse links: LV HRC type 3NA, DIAZED type 5SB, NEOZED type 5SE Operating class gG 6 A
Supply of		
• Motor starters		Yes
• Electronic modules		No
• Ex(i) modules		No
• BG certification		Yes
• UL, CSA certification		Yes
Cable length for EMERGENCY STOP and ON buttons	m	max. 1 000
Mounting dimensions (W x H x D)	mm	30 x 196.5 x 117.5 (incl. terminal module)
Enabling circuits with PM-D F5		4 (floating)

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PM-D FX1 safety module (infeed terminal module)		
Dimensions		
Mounting dimensions (W x H x D)	mm	30 x 196.5 x 117.5 (incl. terminal module)
Module-specific specifications		
Ambient temperature	°C	0 ... +60
Degree of protection		IP20
Maximum achievable safety classes		
• IEC 62061		SIL 3
• DIN V 19250		Tripping class 5 and 6
• ISO 13849-1		PL e
Safety characteristics		
Proof-test interval		10 years
Voltages, currents, potentials		
Rated control supply voltage U_s	V DC	21.6 ... 26.4 to 60 °C
Rated operational current I_e	A	6
Recommended upstream short-circuit protection	A	Internal fuse protection 7 A (quick-response) Melting fuse gG 6.3
Supply of		
• Failsafe motor starters		Yes
• Failsafe frequency converters		Yes
• Electronic modules		No
• Ex[i] modules		No
Current consumption		
• From the backplane bus	mA	≤ 10
• From U_1	mA	≤ 35
• From SGx	mA	≤ 15
Status, alarms, diagnostics		
Alarms		None
Diagnostic functions		
• Group fault/device fault		Red "SF" LED
• Monitoring of the electronics power supply U 1 (PWR)		Green LED PWR
• Monitoring of six switch-off groups		Green LED SG1 ... SG6
• Diagnostics information can be read out		Yes
Standards, approvals		
• TÜV		Yes
• UL, CSA certification		Yes


F-CM contact multipliers		
Dimensions		
Dimensions (W x H x D)	mm	30 x 196.5 x 117.5 (incl. terminal module)
Module-specific specifications		
Number of relay outputs		4 (4 x 1-channel or 2 x 2-channel safe coupling / contact multiplication)
Internal power supply for busbar		U1 (from PM-D F / PM-D FX1)
Maximum achievable safety class		SIL 3
• According to IEC 62061		AK 6
• According to DIN VDE 0801		Cat. 4
• According to ISO 13849-1		
Voltages, currents, potentials		
Switching capacity of relay outputs		Utilization category DC-13 (I_g/U_g): 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
Status, alarms, diagnostics		
Status display		PWR and STAT
Alarms: Diagnostic interrupt		None
Diagnostic functions		Yes
• Group fault display		Red LED (SF)
• Diagnostics information can be read out		Possible
• Monitoring of the electronics power supply U_1 (PWR)		Green LED PWR
• Monitoring of the switching status of the enabling circuit		Red/green LED STAT
PM-D F PROFI-safe safety modules		
Dimensions		
Dimensions (W x H x D)	mm	30 x 196.5 x 117.5 (incl. terminal module)
Module-specific specifications		
Number of outputs, switching to P potential		6 switch-off groups (safety group 1 ... 6)
Internal power supply for busbar		U1
Assigned address range		
• in the PII	Byte	5
• in the PIQ	Byte	5
Maximum achievable safety class		SIL 3
• According to IEC 62061		AK 6
• According to DIN VDE 0801		Cat. 4
• According to ISO 13849-1		
Voltages, currents, potentials		
Supply voltage	V	24 DC
Electrical separation		Yes
• Between outputs and backplane bus		No
• Between outputs and power supply		No
• Between outputs		No
• Between outputs/power supply and shield		Yes
Status, alarms, diagnostics		
Status display		Green LED per SG Green LED for electronics supply Green LED for load voltage
Alarms: Diagnostic interrupt		"ON"
Diagnostic functions		Red LED (SF)
• Group fault display		Possible
• Diagnostics information can be read out		
Settings		
Module address		Diverse: 1. Using a safety-related parameter in the parameterization message frame via the backplane bus 2. Using the 10-pole DIL switch (binary-coded) on the left side of the module The received address is then compared with the DIL switch setting.

I/O systems

ET 200 systems for the control cabinet

ET 200S - Motor starters and Safety motor starters

Safety modules local and PROFIsafe**Selection and ordering data**

Version	Article No.	
Safety modules local		
 <p>3RK1903-3DA00</p>	<p>PM-D F1 With diagnostics Safety module for EMERGENCY STOP application Monitored start</p>	<p>3RK1903-1BA00</p>
	<p>PM-D F2 With diagnostics Safety module for protective door monitoring Automatic start</p>	<p>3RK1903-1BB00</p>
	<p>PM-D F3 With diagnostics Safety module for expanding PM-D F1/2 for another voltage group Time-delayed 0 to 15 s</p>	<p>3RK1903-1BD00</p>
	<p>PM-D F4 With diagnostics Safety module for expanding PM-D F1/2 for another voltage group</p>	<p>3RK1903-1BC00</p>
	<p>PM-D F5 With diagnostics Safety module for expanding PM-D F1...4 with four floating enabling circuits Contact multipliers</p>	<p>3RK1903-1BE00</p>
	<p>PM-D FX1 With diagnostics Infeed terminal module for supply of 1 to 6 switch-off groups</p>	<p>3RK1903-3DA00</p>
	<p>FC-M contact multipliers With 4 safe floating contacts</p>	<p>3RK1903-3CA00</p>
Safety modules PROFIsafe		
	<p>PM-D F PROFIsafe safety modules For PROFIBUS and PROFINET For Failsafe motor starters For Failsafe contact multipliers With six switch-off groups (SG1 to SG6)</p>	<p>3RK1903-3BA02</p>
	<p>F-CM contact multipliers With 4 safe floating contacts</p>	<p>3RK1903-3CA00</p>

Overview**Terminal modules for PM-D F1/F2/F3/F4/F5 safety modules**

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 safety module (connection module).

TM-PF30 S47-B1

This 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 monitoring. The 24 V control 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

This 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 monitoring. 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

This terminal module is always positioned at the beginning of a safety segment expansion in a new station, e.g. at an interlace 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 control supply voltages for the electronics (U1) and those for supplying the contactors (U2) are fed in anew.

The shutdown command from an upstream ET 200S station is received through a safe input. Separate terminals are available for connecting the feedback circuit to the upstream ET 200S station. It is not possible to connect safety sensors to this terminal module.

TM-PF30 S47-C0

This 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 control 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. It is not possible to connect safety sensors to this terminal module.

TM-PF30 S47-D0

This 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. It is not possible to connect safety sensors to this terminal module.

Terminal module for PM-X safety module (TM-X)TM-X15 S27-01

For connection of an external infeed contactor (second shutdown option) for SIL 2 and SIL 3 or PL d and PL e. The PM-X safety module (connection module) is plugged on the right next to 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 PL c (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.

I/O systems


ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

Safety modules local and PROFIsafe terminal modules

Technical specifications

TM-PFX30 S47/TM-PF30 S47 terminal modules		
Dimensions		
• Mounting dimensions (W x H x D)	mm	30 x 196.5 x 102
• Depth with power module	mm	117.5
Insulation voltages and rated currents		
• Insulation voltage	V	500
• Rated operational voltage	V DC	24
• Rated operational current	A	10
Conductor cross-sections		
• Solid	mm ²	1 x (0.14 ... 2.5), according to IEC 60947 1 x 2.5
• Finely stranded with end sleeve	mm ²	1 x (0.14 ... 1.5), according to IEC 60947
• AWG cables, solid or stranded	AWG	1 x (18 ... 22)
Wiring		
• Required tool		Standard screwdriver size 1
• Tightening torque	Nm	0.4 ... 0.7

Selection and ordering data

Version	Article No.
Terminal modules for Safety modules local	
 <p>3RK1903-1AA00</p>	TM-PF30 S47-B1 terminal module For PM-D F1/2 safety modules With infeed U1/U2 and sensor connection 3RK1903-1AA00
	TM-PF30 S47-B0 terminal module For PM-D F1/2 safety modules With sensor connection 3RK1903-1AA10
	TM-PF30 S47-C1 terminal module For PM-D F3/4 safety modules With infeed U1/U2 and control input IN+/IN- 3RK1903-1AC00
	TM-PF30 S47-C0 terminal module For PM-D F3/4 safety modules With infeed U2 3RK1903-1AC10
	TM-PF30 S47-D0 terminal module For PM-D F5 safety modules 3RK1903-1AD10
	TM-X15 S27-01 terminal module For PM-X safety module 3RK1903-1AB00
	TM-P15-S27-01 terminal module For PM-D power module 3RK1903-0AA00
	TM-PFX30 S47-G0/G1 terminal module For PM-D FX1 safety modules (infeed terminal modules) • Infeed left (TM-PFX30 S47-G0) 3RK1903-3AE10 • Infeed center (TM-PFX30 S47-G1) 3RK1903-3AE00
	TM-FCM30 S47-F01 terminal module For F-CM contact multipliers 3RK1903-3AB10
	Terminal modules for Safety modules PROFIsafe
TM-PF30 S47-F0 terminal module For PM-D F PROFIsafe safety modules 3RK1903-3AA00	
TM-FCM30 S47-F01 terminal module For F-CM contact multipliers 3RK1903-3AB10	

Overview**Accessories for Standard motor starters**Control kit

The control kit for the Standard motor starter makes it possible to test 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 local control station without a 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 dissipation 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 "SIMATIC ET 200S" manual. If you have any queries concerning the use of the distance module, contact Technical Support for Siemens Industrial Controls (Fax: +49(0)911/895-5907).

Accessories for High Feature motor starters2DI LC COM control module

The 2DI LC 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. Local 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 an xB3 or xB4 brake control module plugged in to the right, can also be integrated. The signal states of all inputs are transmitted parallel to 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 LC COM control module has in addition a PC interface for connecting the Switch ES Motor Starter parameterization and diagnostics software (Version 2.0 and higher). The module works solely on High Feature motor starters with Motor Starter ES interfaces. The Logo! PC cable is used as the connecting cable between the 2DI LC COM control module and the High Feature motor starter.

Accessories for Standard and High Feature motor startersPE/N bridge modules

PE/N bridge modules are used to bridge gaps of the PE/N bus which are caused, for example, by using brake control modules, PM-D(F) power modules or PM-X connection modules. If a bridge module is used, the supply does not have to be fed in anew. They are available in 15 mm and in 30 mm widths.

L123 bridge modules

The L123 bridge modules are used to bridge gaps of the power bus (see above). They are available in 15 mm and in 30 mm widths.

Brake control modules

For motors with mechanical brakes
(see "General Data" → "Overview", page 9/216)

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 not only have terminals for connecting the motor brake cable, 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 downstream of a motor starter.

Accessories for Standard, High Feature and Failsafe motor startersPE/N terminal blocks

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 blocks are delivered with two caps for closing the PE/N bus contacts on the final terminal block 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 modules local

The Failsafe Kit (F-Kit) is required for Standard motor starters in a safety segment (see page 9/234).

I/O systems

ET 200 systems for the control cabinet
ET 200S - Motor starters and Safety motor starters

Accessories

Technical specifications

Brake control modules xB1, xB2, xB3, xB4, xB5, xB6

		xB1	xB3	xB2	xB4	xB5	xB6
Dimensions (W x H x D)	mm	15 x 196.5 x 125.5 including terminal module on 7.5 mm standard mounting rail					
Rated operational voltage	V	24 DC			500 DC (at least 100)		400 AC
Power supply		Externally through terminal module		From brake rectifier through terminal module		Externally through terminal module	
Rated operational current	A	4		0.7		0.5	
Reverse polarity protection		No, in the event of polarity reversal the brake is released and the overload/short-circuit protection is ineffective					Not applicable
Overload/short-circuit protection		Electronic					1 A melting fuse
Conductor cross-section of terminal module for brake control module	mm ²	1 x 2.5 without end sleeve 1 x 1.5 with end sleeve					
Number of outputs		0	1 (used internally)	0	1 (used internally)	0	1 (used internally)
Number of inputs		0	2	0	2	0	2
Address area required per module							
• With summary		0	2 bits	0	2 bits	0	2 bits
• Without summary		0	1 byte	0	1 byte	0	1 byte
Diagnostic functions							
• Group fault "SF"		Red LED					
• Switching status for brake "STAT"		Yellow LED					
• Inputs 1 and 5		--	Green LED	--	Green LED	--	Green LED
Parameters (default value underlined)							
• 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

Selection and ordering data

Version	Article No.
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Accessories for Standard motor starters



3RK1903-OCA00

Control kits
for manually operating the contactor contacts during start up and servicing
(one set contains five control kits)

3RK1903-OCA00



3RK1903-OCG00

Control units
for direct contactor control
(manual control)
24 V DC

3RK1903-OCG00



3RK1903-OCD00

DM-V15 distance modules
for DS1-x direct-on-line starters
with high temperatures or high current loading
15 mm wide

3RK1903-OCD00




Version	Article No.	
Accessories for Standard motor starters(continued)		
 <p>3RK1903-2AA00</p>	<p>PE/N M45-PEN-F terminal blocks 45 mm wide including two caps in combination with TM-DS45-S32/ TM-RS90-S32</p>	<p>3RK1903-2AA00</p>
 <p>3RK1903-2AA10</p>	<p>PE/N M45-PEN-S terminal blocks 45 mm wide in combination with TM-DS45-S31/TM-RS90-S31</p>	<p>3RK1903-2AA10</p>
Accessories for High Feature motor starters		
 <p>3RK1903-0CH20</p>	<p>2DI LC COM control module 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 Starter ES, connected using LOGO! PC cable</p>	<p>3RK1903-0CH20</p>
 <p>3RK1922-3BA00</p>	<p>Hand-held device For ET 200S High Feature motor starters (or for ET 200pro and M200D motor starters) for local operation. The motor starter-specific serial interface cables must be ordered separately. The LOGO! PC cable is used for the MS ET 200S HF.</p>	<p>3RK1922-3BA00</p>
 <p>6ED1057-1AA01-0BA0</p>	<p>LOGO! USB PC cable For connecting the ET 200S High Feature motor starters to the RS232 interface of a PG/PC/laptop (with the Motor Starter ES software) or the hand-held device 3RK1922-3BA00.</p>	<p>6ED1057-1AA01-0BA0</p>
 <p>3RK1903-2AC10</p>	<p>M65-PEN-F terminal block 65 mm wide, including two caps, in combination with TM-DS65-S32/TM-RS130-S32</p>	<p>3RK1903-2AC00</p>
	<p>M65-PEN-S terminal block 65 mm wide, in combination with TM-DS65-S31/TM-RS130-S31</p>	<p>3RK1903-2AC10</p>

I/O systems

ET 200 systems for the control cabinet
 ET 200S - Motor starters and Safety motor starters

Accessories

Version	Article No.	
Accessories for Standard/High Feature motor starters		
 3RK1903-0AH00	M15-PE/N bridge module 15 mm wide for bridging a 15 mm module	3RK1903-0AH00
 3RK1903-0AJ00	M30-PE/N bridge module 30 mm wide for bridging a 30 mm module	3RK1903-0AJ00
 3RK1903-0AE00	M15-L123 bridge module 15 mm wide for bridging a 15 mm module	3RK1903-0AE00
 3RK1903-0AF00	M30-L123 bridge module 30 mm wide for bridging a 30 mm module	3RK1903-0AF00
 3RK1903-0AF20	Sealing caps for L123 and PE/N bridge modules (bag containing 20 units)	3RK1903-0AF20
 3RK1903-0CB00	Brake control modules for motors with mechanical brakes <ul style="list-style-type: none"> • xB1 for motor starters 24 V DC/4 A • xB2 for motor starters 500 V DC/0.7 A • xB3 for motor starters 24 V DC/4 A/2 DI 24 V DC local control with diagnostics, with two inputs • xB4 for motor starters 500 V DC/0.7 A/2 DI 24 V DC local control with diagnostics, with two inputs • xB5 for motor starters 400 V AC without digital input • xB6 for motor starters 400 V AC with two digital inputs 	3RK1903-0CB00 3RK1903-0CC00 3RK1903-0CE00 3RK1903-0CF00 3RK1903-0CJ00 3RK1903-0CK00
	Terminal modules for brake control modules <ul style="list-style-type: none"> • TM-xB15 S24-01 for xB1, xB2 or xB5 • TM-xB215 S24-01 for xB3, xB4 or xB6 	3RK1903-0AG00 3RK1903-0AG01

Version	Article No.	
Accessories for Failsafe motor starters		
M65-PEN-F terminal block with incoming connection, with caps	3RK1903-2AC00	
M65-PEN-S terminal block without incoming connection	3RK1903-2AC10	
Accessories for Safety modules local		
	PM-X safety module (connection module) with diagnostics, for plugging onto TM-X15 S27-01 Module for connecting a safety group and for connecting an external infeed contactor or for connecting to an external safety circuit	3RK1903-1CB00
	F-Kit 1 Failsafe equipment for DS1-x Standard motor starters ¹⁾	3RK1903-1CA00
	F-Kit 2 Failsafe equipment for RS1-x Standard motor starters ¹⁾	3RK1903-1CA01
3RK1903-1CA01		
Manual "SIMATIC ET 200S Motor Starters, Fail-Safe Motor Starters, Safety-Integrated Systems"		
The manual can be downloaded free of charge in PDF format from the Internet, see http://support.automation.siemens.com/WWW/view/en/6008567		

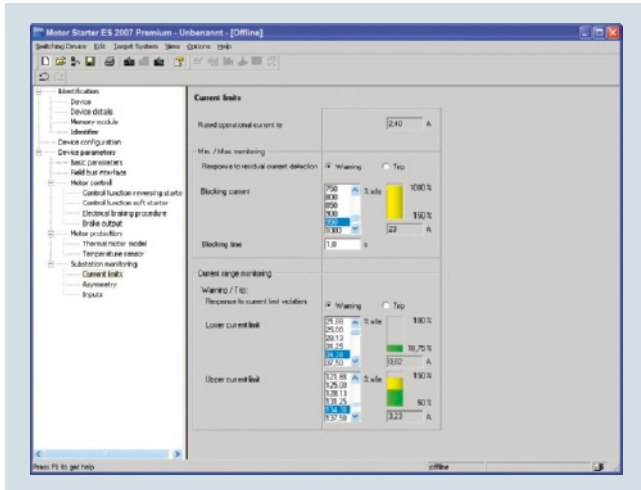
¹⁾ The function of the Failsafe Kit is already integrated into High Feature motor starters.

I/O systems

ET 200 systems for the control cabinet
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

- Through the local interface on the device
- With PROFIBUS DP V1-capable motor starters from any point in PROFIBUS or in PROFINET (applies to ET 200S DP V1/ET 200pro/ECOFAST/M200D)
- With PROFINET capable motor starters from any point in PROFINET or in PROFIBUS (applies to ET 200S DP V1/ ET 200pro/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.

Efficient engineering with three program versions

The Motor Starter ES software program is available in three versions which differ in their user-friendliness, scope of functions and price.

Motor Starter ES	Basic	Standard	Premium
ET 200S High Feature PROFIBUS IM	✓	✓	✓
ET 200S High Feature PROFINET IM	✓	✓	✓
ECOFAST AS-Interface High Feature	✓	✓	--
ECOFAST PROFIBUS	✓	✓	✓
ET 200pro PROFIBUS IM	✓	✓	✓
ET 200pro PROFINET IM	✓	✓	✓
M200D AS-Interface Standard	✓	✓	(✓)
M200D PROFIBUS	✓	✓	✓
M200D PROFINET	✓	✓	✓

✓ Function available, (✓) Available with restricted functionality

-- Function not available

Motor Starter ES	Basic	Standard	Premium
Access through the local interface on the device	✓	✓	✓
Parameter assignment	✓	✓	✓
Operating	✓	✓	✓
Diagnostics	--	✓	✓
Creation of typicals	--	✓	✓
Comparison functions	--	✓	✓
Standard-compliant printout according to EN ISO 7200	--	✓	✓
Service data (min/max pointer, statistics data)	--	✓	✓
Access through PROFIBUS	--	--	✓
Access through PROFINET	--	--	✓
S7 routing	--	--	✓
Teleservice through MPI	--	--	✓
STEP 7 Object Manager	--	--	✓
Trace function	--	✓	✓

✓ Function available

-- Function not available

Additional functions

- Standard-compatible printouts
The software tool greatly simplifies machine documentation. It enables parameterization printouts according to EN ISO 7200. The elements to be printed are easy to select and group as required.
- Easy creation of typicals
Typicals can be created for devices and applications with only minimum differences in their parameters. These typicals contain all the parameters which are needed for the parameterization. In addition it is possible to specify which of these parameters are fixed and which can be adapted, e.g. by the startup engineer.
- Teleservice via MPI
The Motor Starter ES Premium version supports the use of MPI Teleservice (comprising the Teleservice software and various Teleservice adapters) for remote diagnostics of the devices. This facilitates diagnostics and maintenance, and it shortens response times for service purposes.

Types of delivery and license

Motor Starter ES is available with the following licenses:

- 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 may only be installed once)
 - 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)

The following delivery versions are also available 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 for 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 (for selected countries) as an easy and quick way for you to receive additional licenses for your software.
For more information see www.siemens.com/tia-online-software-delivery.

System requirements

Parameterization, start up and diagnostics software

Motor Starter ES 2007

For ECOFAST motor starters, SIMATIC ET 200S High Feature starters, SIMATIC ET 200pro starters, and M200D (AS-I standard, PROFIBUS, PROFINET)

Operating system	Windows XP Professional (Service Pack 2 or 3) Windows 7 32/64-bit Professional/Ultimate/Enterprise (Service Pack 1)
Processor	≥ Pentium 800 MHz/≥ 1 GHz (Windows 7)
RAM	≥ 512 MB (Windows XP Professional)/≥ 1 GB (Windows 7 32-bit)/ ≥ 2 GB (Windows 7 64-bit)
Monitor resolution	≥ 1024 x 768
Free space on hard disk¹⁾	≥ 400 Mbyte
CD-ROM/DVD drive	Yes (only when installing from CD)
Interface	Depends on PC cable: serial (COM) or USB
PC cable/parameterization cable/connection cable	Yes
PROFIBUS card/PROFIBUS processor	Optional, for parameterization and diagnostics through PROFIBUS
Ethernet interface/PROFINET card	Optional, for parameterization and diagnostics through PROFINET

¹⁾ Additional free space recommended, e.g. for swap-out file.

Benefits

- Fast, error-free configuration and startup of motor starters even without extensive previous knowledge
- Transparent setting of the device functions and their parameters – online and offline
- Effective diagnostics functions on the soft starter and display of the most important measured values
- Trace function (oscilloscope function) for recording measured values and events (included in the Motor Starter ES Standard and Premium software version for M200D PROFIBUS and PROFINET).

I/O systems

ET 200 systems for the control cabinet

ET 200S - Software

Motor Starter ES



Selection and ordering data

Parameterization, start up and diagnostics software

Motor Starter ES 2007

For ECOFAST motor starters, SIMATIC ET 200S High Feature starters, SIMATIC ET 200pro starters, and M200D (AS-I standard, PROFIBUS, PROFINET)


- Delivered without PC cable

Version	Article No.
Motor Starter ES 2007 Basic	
 <p>Floating license for one user Engineering software in limited-function version for diagnostics purposes Software and documentation on CD, 3 languages (German/English/French), communication through system interface</p> <ul style="list-style-type: none"> License key on USB stick, Class A, including CD License key download, Class A, without CD 	<p>3ZS1310-4CC10-0YA5 3ZS1310-4CE10-0YB5</p>
3ZS1310-4CC10-0YA5	
Motor Starter ES 2007 Standard	
 <p>Floating license for one user Engineering software, software and documentation on CD, 3 languages (German/English/French), communication through system interface</p> <ul style="list-style-type: none"> License key on USB stick, Class A, including CD License key download, Class A, without CD 	<p>3ZS1310-5CC10-0YA5 3ZS1310-5CE10-0YB5</p>
3ZS1310-5CC10-0YA5	
	Upgrade for Motor Starter ES 2006
	<p>Floating license for one user, engineering software, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface</p> <p>3ZS1310-5CC10-0YE5</p>
	Powerpack for Motor Starter ES 2007 Basic
	<p>Floating license for one user, engineering software, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface</p> <p>3ZS1310-5CC10-0YD5</p>
	Software Update Service
	<p>For 1 year with automatic extension, assuming the current software version is in use, engineering software, software and documentation on CD, communication through the system interface</p> <p>3ZS1310-5CC10-0YL5</p>

Notes:

Please order PC cable separately, [see page 9/251](#).

For description of the software versions, [see page 9/248](#).


Version	Article No.	
Motor Starter ES 2007 Premium		
 <p>3ZS1310-6CC10-0YA5</p>	Floating license for one user Engineering software, software and documentation on CD, 3 languages (German/English/French), communication through system interface or PROFIBUS/PROFINET, STEP7 Object Manager <ul style="list-style-type: none"> • License key on USB stick, Class A, including CD • License key download, Class A, without CD 	3ZS1310-6CC10-0YA5 3ZS1310-6CE10-0YB5
	Upgrade for Motor Starter ES 2006 Floating license for one user, engineering software, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface or PROFIBUS/PROFINET, STEP7 Object Manager	3ZS1310-6CC10-0YE5
	Powerpack for Motor Starter ES 2007 Standard Floating license for one user, engineering software, license key on USB stick, Class A, 3 languages (German/English/French), communication through system interface or PROFIBUS/PROFINET, STEP7 Object Manager	3ZS1310-6CC10-0YD5
	Software Update Service For 1 year with automatic extension, assuming the current software version is in use, engineering software, software and documentation on CD, communication through the system interface or PROFIBUS/PROFINET, STEP7 Object Manager	3ZS1310-6CC10-0YL5

Notes:

Please order PC cable separately, [see Accessories](#).

For description of the software versions, [see page 9/248](#).

Accessories

Version	Article No.	
Optional accessories		
 <p>3RK1903-0CH20</p>	2DI LC COM control module For ET 200S High Feature starter, Failsafe starter A	3RK1903-0CH20
	LOGO! USB PC cable For ET 200S High Feature starter	6ED1057-1AA01-0BA0
	RS 232 interface cable Serial data connection between ET 200pro MS/FC, M200D and laptop/PC/PG or MS	3RK1922-2BP00
	USB interface cable Serial data connection between ET 200pro MS/FC, M200D and laptop/PC/PG or MS	6SL3555-0PA00-2AA0
	USB/serial adapter For connecting an RS 232 PC cable to the USB interface of a PC, recommended for use in conjunction with ET 200S/ECOFAS/ET 200pro motor starters	3UF7946-0AA00-0

I/O systems

ET 200 systems for the control cabinet

ET 200S - Add-on products for the ET 200S

EtherNet/IP interface module

Overview

An interface module (EtherNet/IP adapter) is provided for operating the ET 200S on EtherNet/IP. It can be used together with system and IO components of the ET 200S distributed I/O system.

Technical specifications

Article number	ZNX:EIP-200S ETHERNET/IP HEAD ASSEMBLY FOR ET200S
Product type designation	
General information	
Vendor identification (VendorID)	0008h
Device identifier (DeviceID)	0239h
Supply voltage	
Mains buffering	
• Mains/voltage failure stored energy time	20 ms
Input current	
from supply voltage 1L+, max.	250 mA
Power losses	
Power loss, typ.	2.5 W; Typical
Address area	
Addressing volume	
• Inputs	256 byte
• Outputs	256 byte
Interfaces	
PROFINET IO	
• Automatic detection of transmission speed	Yes
• Transmission rate, max.	100 Mbit/s
• Services	See manual
• RJ 45	Yes

Article number	ZNX:EIP-200S ETHERNET/IP HEAD ASSEMBLY FOR ET200S
Diagnostics indication LED	
• Monitoring 24 V voltage supply ON (green)	Yes
• Connection to network LINK (green)	Yes
Galvanic isolation	
between backplane bus and electronics	No
between supply voltage and electronics	No
between Ethernet and electronics	Yes
Permissible potential difference	
between different circuits	75V DC/60V AC
Isolation	
Isolation checked with	500 V
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
Dimensions	
Width	60 mm
Height	119.5 mm
Depth	75 mm
Weights	
Weight, approx.	120 g

Ordering data

Article No.

SIMATIC ET 200S interface module for EtherNet/IP	ZNX:EIP-200S
Including:	
• SD card 2 MB (6ES7954-8LB01-0AA0)	
• Bus termination module for ET 200S (6ES7193-4JA00-0AA0)	
• Connector for 24 V DC supply voltage	
• Companion disk with the manuals and the configuration tool	

Overview

An interface module (DeviceNet adapter) is provided for operating the ET 200S on DeviceNet. It can be used together with system and IO components of the ET 200S distributed I/O system.

Application

Nearly the entire range of ET 200S modules can be used, which makes it possible to use them across all industrial sectors, for example, the automotive industry, bottling plants, or conveyor systems. They can also be used in hybrid industries such as the cement, pharmaceutical or food and beverages industry.

The interface module enables connection of the ET 200S to DeviceNet and handles the communication between the modules and the higher-level control system (scanner) autonomously.

Technical specifications

Article number	ZNX:10000005188 (Basic Version)
Product type designation	DeviceNet Interface Module for ET 200S
Power dissipation, typ.	3.8 W
Address space	
• Outputs	128 bytes
• Inputs	128 bytes
RS 485 interfaces	Yes
Reports	
• PROFINET IO	No
• PROFIBUS DP protocol	No
• Ethernet TCP/IP	No
Isochronous mode (application synchronized up to terminal)	No
Alarms	No
Diagnostics functions	Yes
Connection to the network LINK (green)	Yes
Electrical isolation	
• Between the rear panel bus and electronic components	Yes
• Between electronics block and PROFIBUS DP	Yes
• Between the supply voltage and electronic components	No
Isolation test voltage	500 V
Emission of radio interference acc. to EN 55 011	
• Limit class A, for use in industrial areas	Yes
• Limit class B, for use in residential areas	No
Dimensions	
• Width	45 mm
• Height	109.5 mm
• Depth	75 mm
Weight	300 g

Ordering data**Article No.****SIMATIC ET 200S interface module for DeviceNet****ZNX:10000005188****Including:**

- Bus termination module for ET 200S (6ES7193-4JA00-0AA0)
- Power module PM-E 24 ... 4 V DC/24 ... 230 V AC (6ES7138-4CB11-0AB0)
- Terminal module TM-P (6ES7193-4CD30-0AA0)
- Connector for the connection to DeviceNet.

I/O systems

ET 200 systems for the control cabinet

ET 200S - Add-on products from third-party manufacturers

Add-on products from third-party manufacturers

Overview

The following catalog pages contain non-binding information on supplementary products that are manufactured and marketed, not by Siemens, but by third-parties outside the Siemens group ("external companies"). These external companies organize the manufacture, sale and delivery of their products independently. Their own terms and conditions of business and delivery apply.

Responsibility for these supplementary products and for the related information presented here therefore rests exclusively with the respective external company. Unless compulsory by law, Siemens assumes no liability and makes no guarantee for the supplementary products of external companies. Please refer also to the note on "Exemption from liability/Use of hyperlinks" included with each product.

Overview

The 1-STEP-DRIVE-5A-48V module from Phytron GmbH is a high-precision stepper motor control with integrated power output stage for use in the SIMATIC ET 200S distributed I/O system.

The module can be used together with system and I/O components of the ET 200S distributed I/O system. Operation is possible with the following head assemblies:

- IM PROFIBUS
- IM PROFINET
- ET 200S CPU

Corresponding GSD files and an HSP are available for this.

Note:

The 1-STEP-DRIVE-5A-48V module is a Phytron GmbH product and can only be obtained from them.

Application

High-precision control of stepper motors:

The technology of the 1-STEP-DRIVE-5A-48V enables highly precise current settings which facilitate fine positioning up to 1/512 step with an absolute error of only $\sim 0.0015^\circ$. This corresponds to approx. 102,400 positions per revolution or $0.0035^\circ/\text{step}$ with a 200-step motor.

The module permits connection of a 2-phase stepping motor in the 200 W power range up to 5 A peak with a power supply of 24 to 48 V DC.

Sample function blocks are available for operation with SIMATIC and can be downloaded by the user from the Internet site specified below and then modified.

The 1-STEP-DRIVE-5A-48V provides the following positioning functions:

- Absolute positioning
- Relative positioning
- Reference point approach
- Endless axes: Speed mode/frequency output
- Selection of feedback value

In the manufacturer's manual, you can find a list of possible terminal modules with which the 1-STEP-DRIVE-5A-48V can be operated.

Technical specifications

- Suitable for bipolar control of 2-phase stepping motors of 4-, (6-) or 8-wire design (in 4-wire system)
- 5 A peak phase current with adjustable current steps
- Power supply 24 V to 48 V DC
- Up to 1/512 microstep (physical resolution: approx. 102,400 positions per revolution ($0.0035^\circ / \text{step}$)). A counter module with encoder should be evaluated for microstep positioning
- Maximum step frequency: 510,000 steps/s
- 2 digital inputs for limit and reference switches
- Diagnostics LEDs (overcurrent, overtemperature, traversing task or motor running, ...)
- Short-circuit-proof, overload-proof
- Online power output stage parameterization and diagnostics
- Boost: boosted torque during acceleration or braking
- Selectable current controller frequency: 18, 20, 22 or 25 kHz

I/O systems

ET 200 systems for the control cabinet

ET 200S - Add-on products from third-party manufacturers

SIMATIC ET 200S 1-STEP-DRIVE-5A-48V

More information

You can find further information on the module and associated contact information on the Internet at:

<http://www.phytron.de/1-step-drive>

There you will also find the manual, the data sheet, the HSP, a link to the GSD files as well as sample function blocks for SIMATIC.

You can find Service and Support at:

<http://www.phytron.de/support>

Exemption from liability/Use of hyperlinks

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Overview

A CANopen module (1 SI CANopen) from HMS is available for use in ET 200S. It can be used together with system and I/O components of the ET 200S distributed I/O system. Operation is possible with the following head assemblies:

- IM PROFIBUS
- IM PROFINET
- ET 200S CPU

Corresponding GSD files and an HSP are available for this.

In the manual, you can find a list of possible terminal modules with which the 1 SI CANopen module can be operated.

Please note that the module cannot be operated together with the ET 200S COMPACT or the BASIC header of the ET 200S. Please refer to the manual for the currently approved Article No.'s. of the ET 200S head assemblies.

Note:

The 1 SI CANopen module is an HMS product and can only be obtained from them.

Application

CANopen is a widely used industrial bus system suitable for a variety of different applications. The module allows simple and cost-effective connection of CANopen applications to SIMATIC.

- Control of hydraulic valves/axes in vehicles
- Control of motors in packaging machines or conveyors
- Capturing of angular encoder positions in wind turbines
- Capturing of control devices on machines, e.g. joysticks
- Capturing the measured data of path encoders, inclinometers or angular encoders, e.g. for tower cranes or gantry cranes

The 1 SI CANopen module has the following properties:

- Operation either as CAN master or CAN slave
- The module complies with the CiA301rev CANopen specification. 4.2 or CiA302 (master).
- It supports the transparent CAN 2.0A standard (11-bit identifier). In this mode, CAN message frames can be sent and received by the CPU program, thus enabling implementation of customized CAN protocols.
- When used as master, up to 126 slaves, e.g. valves or actuators, can be operated on the module.

More information

The CANopen bus can be configured via any commercially available CANopen configuration tool. The HMS company provides corresponding "Anybus Configuration Manager CANopen" software together with the product. The configuration is saved directly in the module by means of a point-to-point connection via a USB to CAN adapter. Routing via PROFIBUS/PROFINET is not possible.

Function blocks are available for operation with SIMATIC and can be downloaded by the user from the Internet site specified below.

The module is also available in a SIPLUS version for use in extreme conditions as encountered e.g. on vehicles used outdoors. This version is also only available from HMS.

For further information, please contact HMS directly:

<http://www.hms-networks.com/can-for-et200s>

There you will also find the manual, the HSP, a link to the GSD files as well as the function blocks for SIMATIC.

I/O systems

ET 200 systems for the control cabinet

ET 200S - Add-on products from third-party manufacturers

SIMATIC ET 200S 1 SI CANopen

More information (continued)

Ordering and Support

Please note that ordering and support for the module are exclusively carried out via HMS. Please contact HMS directly should you have any questions concerning this module. The relevant contact details can be found on the Internet at:

<http://www.hms-networks.com/can-for-et200s>

Exemption from liability/Use of hyperlinks

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Overview



The SIMATIC ET 200MP is a modular and scalable I/O system with IP20 degree of protection for universal use, and offers the same system advantages as the S7-1500. The SIMATIC ET 200MP permits extremely short bus cycles and very fast response times, even with large quantity structures.

SIMATIC ET 200MP consists of the following components:

- Interface module for connecting S7-1500 I/O modules to PROFINET; up to 30 modules can be connected to one interface module.
- Interface module for connecting S7-1500 I/O modules to PROFIBUS; up to 12 modules can be connected to one interface module.

The SIMATIC ET 200MP distributed I/O system is particularly easy to install, wire, and commission.

Highlights:

- Modular I/O system with IP20 protection for PROFINET or alternatively for PROFIBUS
- Compact dimensions
- High degree of user-friendliness due to the following design features:
 - Uniform 40-pin front connector simplifies ordering, logistics, and warehousing
 - Uniform pin assignment per module type simplifies wiring and helps avoid errors
 - Integrated potential bridges simplify wiring and allow flexible subsequent modification
 - The cable storage space grows along with the requirements and allows a uniform appearance even with insulated conductors with a large cross-section and/or thick insulation
 - The prewiring position for the front connector allows convenient wiring both when commissioning and making changes during operation

- The DIN rail integrated in the S7-1500 mounting rail allows snapping-on of many standard components such as additional terminals, miniature circuit breakers or small relays
- The 1:1 allocation of channel status and diagnostics LED, terminal and inscription allows fast location and elimination of errors. Assistance is provided by the wiring diagram printed on the inside of the front panels.
- The integrated shielding concept for analog and technology modules allows reliable and rugged operation, in particular with high-speed applications. Installation does not require any tools.
- Particularly space-saving and simple design with slim 25 mm modules; the maximum possible station configuration with power supply (PS), interface module (IM) and 30 I/O modules can be accommodated on an 830-mm wide S7-1500 mounting rail.
- Comprehensive product portfolio comprising digital and analog input or output modules, technology modules, and communication modules for point-to-point communication; further modules, e.g. F modules, will be available soon
- Extensive system functions
 - Integrated system diagnostics when operated with an S7-1500 and the TIA portal
 - Increased communication availability by using Media Redundancy Protocol (MRP) on the PROFINET; in addition, the IM 155-5 PN HF High Feature interface module can be operated on an S7-400H. Configuration is carried out with STEP 7 V5.5 SP3 and a GSDML file. The IM 155-5 PN HF also supports the functions MRPD (Media Redundancy with Planned Duplication) and operation on an S7-400H CPU (system redundancy).
 - Consistent use of identification and maintenance data IM0 to IM3 for fast electronic and unambiguous identification of individual modules (Article No., serial number, etc.).
 - Uniform firmware update for the interface module and all I/O modules for subsequent expansion of functions (investment security)
 - Bus cycle time $\geq 250 \mu\text{s}$ and coupling to the isochronous task permit implementation of applications with high performance requirements with PROFINET
 - Up to 30 I/O modules (PROFINET) or 12 I/O modules (PROFIBUS) within a station save on interface modules and installation time
 - CompactFlash card not required with PROFINET; automatic address assignment via LLDP or manually via TIA portal or PST tool
 - Shared Device on up to two (IM 155-5 PN ST) or four (IM 155-5 PN HF) IO Controllers
 - Modular Shared Input / Modular Shared Output as system function for all S7-1500 I/O modules

I/O systems

ET 200 systems for the control cabinet
ET 200MP – Interface modules

IM 155-5 PN

Overview



- Interface modules for linking the ET 200MP to PROFINET
- These handle data exchange with the PROFINET IO controller in the PLC
- Integrated 2-port switch for line topology
- Max. 30 I/O modules
- Shortest bus cycle 250 μ s
- Linking to the isochronous task of the CPU
- Prioritized fast startup (FSU) with 500 ms (max. 12 I/O modules)
- Media Redundancy Protocol (MRP)
- Shared device on up to two I/O controllers (when configuring using GSD file; depends on the respective configuration tool)
- Omission of SIMATIC memory card (SMC); IM replacement without PG using LLDP

Starting from FW version V2.0.0, the IM155-5 PN ST interface module supports the following new functions:

- Submodule-granular shared device with up to two I/O controllers
- Configuration control (option handling)
- Module-internal shared input and output (MSI/MSO), i.e. the inputs or outputs of a module can be made available simultaneously to up to two I/O controllers

The IM155-5 PN HF interface module has the following additional functions:

- Shared device on up to 4 IO controllers
- Module-internal shared input and output (MSI/MSO) on up to four IO controllers
- Operation on a highly available SIMATIC S7-400H
- Support for the MRPD function (media redundancy with planned duplication)

Technical specifications

Article number	6ES7155-5AA00-0AB0 IM 155-5 PN ST	6ES7155-5AA00-0AC0 IM 155-5 PN HF
Product type designation		
General information		
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with		
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -
Supply voltage		
Type of supply voltage	DC	DC
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
short-circuit protection	Yes	Yes
Mains buffering		
• Mains/voltage failure stored energy time	5 ms	5 ms
Hardware configuration		
Integrated power supply		Yes
Rack		
• Modules per rack, max.	30; I/O modules	30; I/O modules
Interfaces		
Number of PROFINET interfaces	1	1
1st interface		
Interface types		
- Number of ports	2	2
- Integrated switch	Yes	Yes
- RJ 45 (Ethernet)	Yes	Yes
Protocols		
- PROFINET IO Device	Yes	Yes
- Media redundancy	Yes	Yes
Interface types		
RJ 45 (Ethernet)		
• 10 Mbps		No
• 100 Mbps	Yes	Yes
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
Protocols		
PROFINET IO		
• PROFINET IO	Yes	Yes
PROFINET IO Device		
Services		
- Isochronous mode	Yes	Yes
- IRT	Yes	Yes
- MRP	Yes	Yes
- MRPD		Yes
- PROFINET system redundancy		Yes
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO controllers with shared device, max.	2	4
Open IE communication		
• TCP/IP	Yes	Yes
• SNMP	Yes	Yes
• LLDP	Yes	Yes

I/O systems

ET 200 systems for the control cabinet
ET 200MP – Interface modules

IM 155-5 PN**Technical specifications** (continued)

Article number	6ES7155-5AA00-0AB0 IM 155-5 PN ST	6ES7155-5AA00-0AC0 IM 155-5 PN HF
Isochronous mode		
Isochronous operation (application synchronized up to terminal)	Yes	Yes
equidistance	Yes	Yes
shortest clock pulse	250 µs	250 µs
max. cycle	4 ms	4 ms
Interrupts/diagnostics/ status information		
Status indicator	Yes	Yes
Alarms		
• Alarms	Yes	Yes
Diagnostic messages		
• Diagnostic functions	Yes	Yes
Diagnostics indication LED		
• RUN LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED
• MAINT LED	Yes; yellow LED	Yes; yellow LED
• Connection display LINK TX/RX	Yes; yellow LED	Yes; yellow LED
Isolation		
Isolation checked with	707 V DC (type test)	707 V DC (type test)
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	310 g	350 g

Ordering data

	Article No.	Article No.
IM 155-5 PN interface module IP 20 degree of protection, module width 35 mm, installation on S7-1500 mounting rail IM 155-5 PN ST, standard version IM 155-5 PN HF, High Feature version with additional functions	6ES7155-5AA00-0AB0 6ES7155-5AA00-0AC0	6ES7590-5AA00-0AA0
Accessories		
Front flap for IM 155-5 PN (spare part), 5 units	6ES7528-0AA70-7AA0	
SIMATIC S7-1500 mounting rail Fixed lengths, with grounding elements • 160 mm • 245 mm • 482 mm • 530 mm • 830 mm For cutting to length by customer, without drill holes; grounding ele- ments must be ordered separately • 2000 mm	6ES7590-1AB60-0AA0 6ES7590-1AC40-0AA0 6ES7590-1AE80-0AA0 6ES7590-1AF30-0AA0 6ES7590-1AJ30-0AA0 6ES7590-1BC00-0AA0	PE connection element for mounting rail 2000 mm 20 units Power supply For supplying the backplane bus of the S7-1500 24 V DC input voltage, power 25 W 24/48/60 V DC input voltage, power 60 W 120/230 V AC input voltage, power 60 W Power connector With coding element for power supply module; spare part, 10 units Load power supply 24 V DC/3 A 24 V DC/8 A Power supply connector Spare part; for connecting the 24 V DC supply voltage • with push-in terminals
		6ES7505-0KA00-0AB0 6ES7505-0RA00-0AB0 6ES7507-0RA00-0AB0 6ES7590-8AA00-0AA0 6EP1332-4BA00 6EP1333-4BA00 6ES7193-4JB00-0AA0

Ordering data	Article No.	Ordering data	Article No.
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		IE FC TP Trailing Cable 2 x 2 (Type C) 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 for trailing cable use; PROFINET-compatible; with UL approval; Sold by the meter, max. length 1000 m; minimum order 20 m	6XV1840-3AH10
IE FC RJ45 plug 180 180° cable outlet 1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	IE FC TP Marine Cable 2 x 2 (Type B) 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 marine certified; Sold by the meter, max. length 1000 m; minimum order 20 m	6XV1840-4AH10
IE FC TP Standard Cable GP 2x2 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; Sold by the meter, max. length 1000 m; minimum order 20 m	6XV1840-2AH10	IE FC Stripping Tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00

I/O systems

ET 200 systems for the control cabinet
ET 200MP – Interface modules

IM 155-5 DP

Overview



- Interface module for linking the ET 200MP to PROFIBUS
- Handles data exchange with the PROFIBUS master in the PLC
- Max. 12 I/O modules
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 125; adjustable using DIP switches
- Identification and maintenance data IMO ... IM3

Technical specifications

Article number	6ES7155-5BA00-0AB0 IM155-5 DP ST
Product type designation	
General information	
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	5 ms
Hardware configuration	
Rack	
• Modules per rack, max.	12; I/O modules
Interfaces	
Number of PROFIBUS interfaces	1
Protocols	
- PROFIBUS DP slave	Yes
RS 485	
• Transmission rate, max.	12 Mbit/s
PROFIBUS	
Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- DPV1	Yes

Article number	6ES7155-5BA00-0AB0 IM155-5 DP ST
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	
• Alarms	Yes
Diagnostic messages	
• Diagnostic functions	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
Isolation	
Isolation checked with	707 V DC (type test)
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	360 g

Ordering data	Article No.	Ordering data	Article No.
IM 155-5 DP ST interface module IP 20 degree of protection, module width 35 mm, installation on S7-1500 mounting rail	6ES7155-5BA00-0AB0	FC robust cable Bus cable with PUR sheath for use under conditions of extreme mechanical stress or aggressive chemicals, 2-core, shielded, sold by the meter, maximum delivery unit 1000 m, minimum order quantity 20 m	6XV1830-0JH10
Accessories		FC flexible cable PROFIBUS bus cable, flexible, with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	6XV1831-2K
Front flap for IM 155-5 PN (spare part), 5 units	6ES7528-0AA70-7AA0	FC trailing cable PROFIBUS trailing cable, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	6XV1830-3EH10
SIMATIC S7-1500 mounting rail Fixed lengths, with grounding elements <ul style="list-style-type: none"> • 160 mm • 245 mm • 482 mm • 530 mm • 830 mm For cutting to length by customer, without drill holes; grounding ele- ments must be ordered separately <ul style="list-style-type: none"> • 2000 mm 	6ES7590-1AB60-0AA0 6ES7590-1AC40-0AA0 6ES7590-1AE80-0AA0 6ES7590-1AF30-0AA0 6ES7590-1AJ30-0AA0	FC bus cable PROFIBUS Food bus cable with PE sheath for use in the food and beverages industry, 2-core, shielded, sold by the meter, maximum delivery unit 1000 m, minimum order quantity 20 m	6XV1830-0GH10
PE connection element for mounting rail 2000 mm 20 units	6ES7590-5AA00-0AA0	FC underground cable PROFIBUS underground cable, 2-core, shielded, sold by the meter, maximum delivery unit 1000 m, minimum order quantity 20 m	6XV1830-3FH10
Load power supply 24 V DC/3 A 24 V DC/8 A	6EP1332-4BA00 6EP1333-4BA00	FC FRNC cable PROFIBUS bus cable, flame-retardant and halogen-free, with copolymer sheath FRNC, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	6XV1830-0LH10
Power supply connector Spare part; for connecting the 24 V DC supply voltage <ul style="list-style-type: none"> • with push-in terminals 	6ES7193-4JB00-0AA0	FC trailing cable PROFIBUS trailing cable, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	6XV1831-2L
PROFIBUS connector <ul style="list-style-type: none"> • Connector for PROFIBUS, up to 12 Mbit/s, 90° cable outlet, insulation displacement system, without PG socket • Connector for PROFIBUS, up to 12 Mbit/s, 90° cable outlet, insulation displacement system, with PG socket 	6ES7972-0BA70-0XA0 6ES7972-0BB70-0XA0	IE FC Stripping Tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00
PROFIBUS Stripping Tool Stripping tool for fast stripping of the PROFIBUS	6GK1905-6AA00		
PROFIBUS FastConnect bus cable <ul style="list-style-type: none"> • Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m • 20 m • 50 m • 100 m • 200 m • 500 m • 1000 m 	6XV1830-0EH10 6XV1830-0EN20 6XV1830-0EN50 6XV1830-0ET10 6XV1830-0ET20 6XV1830-0ET50 6XV1830-0EU10		

I/O systems

ET 200 systems for the control cabinet
ET 200MP – Interface modules

SIPLUS IM 155-5 PN**Overview**

- Interface module for linking the ET 200MP to PROFINET
- Handles data exchange with the PROFINET IO controller in the PLC
- Integrated 2-port switch for line topology
- Max. 30 I/O modules
- Shortest bus cycle 250 µs
- Linking to the isochronous task of the CPU
- Prioritized fast startup (FSU) with 500 ms (max. 12 I/O modules)
- Media Redundancy Protocol (MRP)
- Shared device on up to two I/O controllers (when configuring using GSD file; depends on the respective configuration tool)
- Omission of SIMATIC memory card (SMC); IM replacement without PG using LLDP

Note:

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

Technical specifications

Article number	6AG1155-5AA00-7AB0
Based on	6ES7155-5AA00-0AB0 SIPLUS ET 200MP IM 155-5 PN ST
Ambient conditions	
Ambient temperature in operation	
• horizontal installation, min.	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

SIPLUS IM 155-5 PN interface module
(extended temperature range and medial exposure)
IP 20 degree of protection, module width 35 mm, installation on S7-1500 rail

Article No.**6AG1155-5AA00-7AB0****Accessories**

See SIMATIC ET 200MP, interface module IM 155-5 PN, page 9/262

Overview

I/O modules constitute the interface of the SIMATIC ET 200MP to the process:

- Digital and analog modules provide exactly the inputs/outputs required for each task.
- Technology modules for SIMATIC S7-1500 and ET 200MP
 - With integrated functions for high-speed counting and position detection
 - With integrated inputs and outputs for tasks at the process level and short response times
- Communication modules for SIMATIC S7-1500 and ET 200MP
 - For data exchange using point-to-point coupling
 - For connecting to PROFIBUS
 - For connecting to Industrial Ethernet
- Connection system for user-friendly, low-overhead wiring of the S7-1500 and ET 200MP modules

For more information see SIMATIC S7-1500 Catalog, chapter 4.

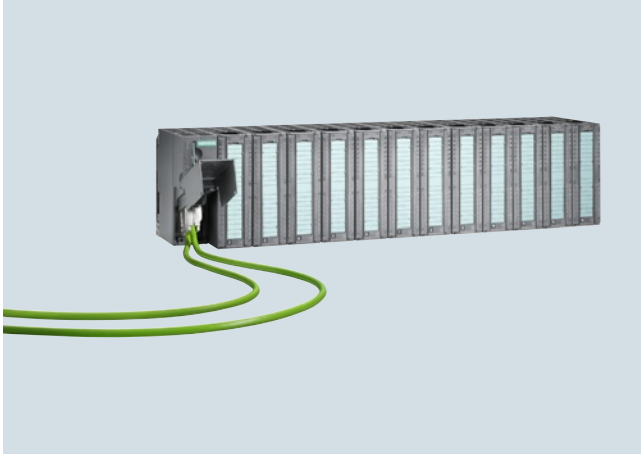
I/O systems

ET 200 systems for the control cabinet

ET 200M

Introduction

Overview



- Modular I/O system with IP20 degree of protection, particularly suitable for user-specific and complex automation tasks
- Consists of a PROFIBUS DP or PROFINET interface module IM 153, up to 8 or 12 I/O modules of the S7-300 automation system (structure with bus connection or with active bus modules), and a power supply if applicable
- 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)
- Modules can be replaced during operation (hot swapping) with the bus modules active
- Transmission rates up to 12 Mbit/s
- Ex approval to Cat. 3 for Zone 2 acc. to ATEX 100 a
- Failsafe digital inputs/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

Cables and connections	Screw and spring-loaded connections in permanent wiring
Degree of protection	IP20
Ambient temperature on vertical wall (preferred mounting position)	
• with horizontal assembly	0 to +60 °C
• with other assembly	0 to +40 °C
Relative humidity	5 to 95% (RH stress level 2 according to IEC 1131-2)
Atmospheric pressure	795 to 1080 hPa
Mechanical stress	
• Vibrations	IEC 68, parts 2 – 6: 10 - 57 Hz (const. amplitude 0.075 mm) 57 - 150 Hz (constant acceleration 1 g)
• Shock	IEC 68, parts 2 – 27 half-sine, 15 g, 11 ms

Overview



The ET 200M system with various interface modules is available for the distributed 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 a reasonably priced variant that is excellently 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

Article number	6ES7153-1AA03-0XB0 ET200M, INTERFACE MODULE IM153-1	6ES7153-2BA02-0XB0 ET200M, INTERFACE IM153-2 HF	6ES7153-2BA82-0XB0 ET200M, INTERFACE IM153-2 HF OUTDOOR
Product type designation			
General information			
Vendor identification (VendorID)	801Dh	801Eh	801Eh
Supply voltage			
Rated value (DC)			
• 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
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
Input current			
Current consumption, max.	350 mA; at 24 V DC	600 mA	650 mA
Inrush current, typ.	2.5 A	3 A	3 A
I _p t	0.1 A ² ·s	0.1 A ² ·s	0.1 A ² ·s
Output voltage			
Rated value (DC)	5 V	5 V	5 V
Output current			
for backplane bus (5 V DC), max.	1 A	1.5 A	1.5 A
Power losses			
Power loss, typ.	3 W	5.5 W	5.5 W

I/O systems

ET 200 systems for the control cabinet

ET 200M – Interface modules

IM 153-1/153-2**Technical specifications** (continued)

Article number	6ES7153-1AA03-0XB0 ET200M, INTERFACE MODULE IM153-1	6ES7153-2BA02-0XB0 ET200M, INTERFACE IM153-2 HF	6ES7153-2BA82-0XB0 ET200M, INTERFACE IM153-2 HF OUTDOOR
Address area			
Addressing volume			
• Inputs	128 byte	244 byte	244 byte
• Outputs	128 byte	244 byte	244 byte
Hardware configuration			
Number of modules per DP slave interface, max.	8	12	12
Time stamping			
Accuracy		1 ms; 1ms at up to 8 modules; 10ms at up to 12 modules	1 ms; 1ms at up to 8 modules; 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
Interfaces			
Interface physics, RS 485	Yes	Yes	Yes
Interface physics, FOC	No	No	No
PROFIBUS DP			
• Node addresses	1 to 125 permitted	1 to 125 permitted	1 to 125 permitted
• Automatic detection of transmission speed	Yes	Yes	Yes
• Output current, max.	90 mA	70 mA	70 mA
• Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
• Transmission procedure	RS 485	RS 485	RS 485
• SYNC capability	Yes	Yes	Yes
• FREEZE capability	Yes	Yes	Yes
• Direct data exchange (slave-to-slave communication)	Yes; Sender	Yes; Sender	Yes; Sender
• Connector type	9-pin sub D socket	9-pin sub D	9-pin sub D
1st interface			
DP slave			
• GSD file	(for DPV1) SIEM801D.GSD; SI01801D.GSG	SI04801.GSG	SI0480E.GSG
• Automatic baud rate search	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7153-1AA03-0XB0 ET200M, INTERFACE MODULE IM153-1	6ES7153-2BA02-0XB0 ET200M, INTERFACE IM153-2 HF	6ES7153-2BA82-0XB0 ET200M, INTERFACE IM153-2 HF OUTDOOR
Protocols			
Bus protocol/transmission protocol	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170
Isolation			
Isolation checked with	Isolation voltage 500 V	Isolation voltage 500 V	Isolation voltage 500 V
Degree and class of protection			
Degree of protection to EN 60529			
• IP20	Yes	Yes	Yes
Ambient conditions			
Ambient temperature in operation			
• Min.	0 °C	0 °C	-25 °C
• max.	60 °C	60 °C	60 °C
Air pressure acc. to IEC 60068-2-13			
• Operating altitude above sea level, max.	3 000 m	3 000 m	3 000 m
Configuration			
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
Dimensions			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	117 mm	117 mm	117 mm
Weights			
Weight, approx.	360 g	360 g	360 g

Article number	6ES7195-7HD10-0XA0 ET200M, BUS UNIT F. 2 IM 153-2 RED.
Product type designation	
Accessories	
belongs to product	ET 200M
Dimensions	
Width	97 mm
Height	92 mm
Depth	30 mm
Weights	
Weight, approx.	133 g

Article number	6ES7195-7HA00-0XA0 ET200M, BUS UNIT F. PS AND IM 153	6ES7195-7HB00-0XA0 ET200M, BUS UNIT F. 2 40MM I/O MODULES	6ES7195-7HC00-0XA0 ET200M, BUS UNIT F. 1 80MM I/O MODULE
Product type designation			
Accessories			
belongs to product	ET 200M	ET 200M	ET 200M
Dimensions			
Width	97 mm	97 mm	97 mm
Height	92 mm	92 mm	92 mm
Depth	30 mm	30 mm	30 mm
Weights			
Weight, approx.	111 g	140 g	127 g

I/O systems

ET 200 systems for the control cabinet

ET 200M – Interface modules

IM 153-1/153-2**Ordering data****Article No.****IM 153-1 interface module**

Slave interface for connecting an ET 200M to PROFIBUS DP

- Standard temperature range

6ES7153-1AA03-0XB0**IM 153-2 interface module**

Slave interface for connecting an ET 200M to PROFIBUS DP; also for use in redundant systems

- High Feature
- High Feature with extended temperature range

6ES7153-2BA02-0XB0
6ES7153-2BA82-0XB0**Active IM 153 /IM 153 bus module**

For two IM 153-2 High Feature modules for designing redundant systems

6ES7195-7HD10-0XA0**Bus module for ET 200M**

- For accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover
- For accommodating two 40-mm wide I/O modules for the hot-swapping function
- For accommodating one 80-mm wide I/O module for the hot-swapping function

6ES7195-7HA00-0XA0**6ES7195-7HB00-0XA0****6ES7195-7HC00-0XA0****ET 200M redundancy bundle**

Comprising two IM 153-2 High Feature modules and one IM 153/IM 153 bus module

6ES7153-2AR03-0XA0**Article No.****Accessories****PROFIBUS bus connector**

90° outgoing cable, terminating resistor with disconnecting function, up to 12 Mbit/s, FastConnect

Without PG interface

- 1 unit
- 100 units

6ES7972-0BA52-0XA0
6ES7972-0BA52-0XB0

With PG interface

- 1 unit
- 100 units

6ES7972-0BB52-0XA0
6ES7972-0BB52-0XB0**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

6ES7195-1GA00-0XA0
6ES7195-1GF30-0XA0
6ES7195-1GG30-0XA0
6ES7195-1GC00-0XA0**SIMATIC S7-300 DIN rail**

- Length: 160 mm
- Length: 480 mm (19")
- Length: 530 mm
- Length: 830 mm
- Length: 2000 mm

6ES7390-1AB60-0AA0
6ES7390-1AE80-0AA0
6ES7390-1AF30-0AA0
6ES7390-1AJ30-0AA0
6ES7390-1BC00-0AA0**S7 Manual Collection****6ES7998-8XC01-8YE0**

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)

S7 Manual Collection, update service for 1 year**6ES7998-8XC01-8YE2**

Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates

Overview



- For connecting 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 PROFI-safe F and HART modules. The operation of an S7-400H (system redundancy) is likewise possible.
- Integrated 2-port switch
- 12 modules per station
- Usable I/O capacity: 192 bytes 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 according to PNO 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

Article number	6ES7153-4AA01-0XB0 IM153-4 PN IO FOR 12 MODULES S7-300	6ES7153-4BA00-0XB0 IM153-4 PN IO HF FOR 12 MODULES S7-300
Product type designation		
General information		
Vendor identification (VendorID)	002AH	002AH
Device identifier (DeviceID)	0302H	0302H
Supply voltage		
Rated value (DC)		
• 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
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)

I/O systems

ET 200 systems for the control cabinet

ET 200M – Interface modules

IM 153-4 PN**Technical specifications** (continued)

Article number	6ES7153-4AA01-0XB0 IM153-4 PN IO FOR 12 MODULES S7-300	6ES7153-4BA00-0XB0 IM153-4 PN IO HF FOR 12 MODULES S7-300
Mains buffering		
• Mains/voltage failure stored energy time	5 ms	5 ms
Input current		
Current consumption, max.	600 mA	600 mA
Inrush current, typ.	4 A	4 A
I _p t	0.09 A ² ·s	0.09 A ² ·s
Output voltage		
Rated value (DC)	5 V	5 V
Output current		
for backplane bus (5 V DC), max.	1.5 A	1.5 A
Power losses		
Power loss, typ.	6 W; Typical	6 W; Typical
Address area		
Addressing volume		
• Inputs	192 byte	672 byte; Extended HART user data
• Outputs	192 byte	192 byte
Hardware configuration		
Number of modules per DP slave interface, max.	12	12
PROFINET IO Controller		
Services		
- PROFINET system redundancy		Yes
Protocols		
Bus protocol/transmission protocol	PROFINET IO	PROFINET IO
Interrupts/diagnostics/status information		
Diagnostics indication LED		
• Connection to network LINK (green)	Yes	Yes
• Transmit/receive RX/TX (yellow)	Yes	Yes
Isolation		
Isolation checked with	500 V DC	Between PROFINET and 24V supply: 1500V AC, between functional grounding and 24V supply: 500V DC
Degree and class of protection		
Degree of protection to EN 60529		
• IP20	Yes	Yes
Ambient conditions		
Ambient temperature in operation		
• Min.	0 °C	0 °C
• max.	60 °C	60 °C
Air pressure acc. to IEC 60068-2-13		
• Operating altitude above sea level, max.	2 000 m	2 000 m
Dimensions		
Width	40 mm	40 mm
Height	125 mm	125 mm
Depth	118 mm	118 mm
Weights		
Weight, approx.	215 g	215 g

Ordering data	Article No.	Article No.	
IM 153-4 PN interface module I/O device for connecting an ET 200M to PROFINET Standard High Feature Accessories Bus modules for ET 200M <ul style="list-style-type: none"> For accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover For accommodating two 40-mm wide I/O modules for the hot-swapping function For accommodating one 80-mm wide I/O module for the hot-swapping function SIMATIC Micro Memory Card 64 KB ¹⁾ SIMATIC DP DIN rail for ET 200M Accommodates bus modules; for hot-swapping function <ul style="list-style-type: none"> Length: 483 mm (19") Length: 530 mm Length: 620 mm Length: 2 000 mm SIMATIC S7-300 DIN rail Length: 160 mm Length: 480 mm (19") Length: 530 mm Length: 830 mm Length: 2000 mm Power supply connector For connection of the 24 V DC power supply; spare part, 1 pack containing 10 units Spring-loaded connection Screw terminal connection	6ES7153-4AA01-0XB0 6ES7153-4BA00-0XB0 6ES7195-7HA00-0XA0 6ES7195-7HB00-0XA0 6ES7195-7HC00-0XA0 6ES7953-8LF30-0AA0 6ES7195-1GA00-0XA0 6ES7195-1GF30-0XA0 6ES7195-1GG30-0XA0 6ES7195-1GC00-0XA0 6ES7390-1AB60-0AA0 6ES7390-1AE80-0AA0 6ES7390-1AF30-0AA0 6ES7390-1AJ30-0AA0 6ES7390-1BC00-0AA0 6ES7193-4JB00-0AA0 6ES7193-4JB50-0AA0	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) S7 Manual Collection update service for 1 year Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates 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 10 units 50 units Industrial Ethernet FastConnect installation cables <ul style="list-style-type: none"> FastConnect standard cable FastConnect trailing cable FastConnect marine cable Industrial Ethernet FastConnect Stripping Tool	6ES7998-8XC01-8YE0 6ES7998-8XC01-8YE2 6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0 6XV1840-2AH10 6XV1840-3AH10 6XV1840-4AH10 6GK1901-1GA00

¹⁾ To operate the IM153-4, an MMC is required with at least 64 KB memory. Cards with higher memory capacity may also be used.

I/O systems

ET 200 systems for the control cabinet

ET 200M – Interface modules

SIPLUS IM 153-1/153-2

Overview



Note:

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

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1153-1AA03-2XB0	6AG1153-2BA02-2XY0	6AG1153-2BA02-7XB0
Based on	6ES7153-1AA03-0XB0 SIPLUS IM153-1	6ES7153-2BA02-0XY0 SIPLUS ET200M IM153-2 EN50155	6ES7153-2BA02-0XB0 SIPLUS_IM153-2
Ambient conditions			
Ambient temperature in operation			
<ul style="list-style-type: none"> Min. max. 	-40 °C; = Tmin 70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	-25 °C; = Tmin 60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	-40 °C; = Tmin 70 °C; = Tmax; 60 °C @ UL/cUL use
Extended ambient conditions			
<ul style="list-style-type: none"> Relative to ambient temperature-atmospheric pressure-installation altitude 	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<ul style="list-style-type: none"> At cold restart, min. 	-25 °C		-25 °C
Relative humidity			
<ul style="list-style-type: none"> With condensation, tested in accordance with IEC 60068-2-38, max. 	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
<ul style="list-style-type: none"> against biologically active substances / conformity with EN 60721-3-3 	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
<ul style="list-style-type: none"> against chemically active substances / conformity with EN 60721-3-3 	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
<ul style="list-style-type: none"> against mechanically active substances / conformity with EN 60721-3-3 	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Technical specifications (continued)

Article number	6AG1195-7HA00-2XA0	6AG1195-7HB00-7XA0	6AG1195-7HC00-2XA0	6AG1195-7HD10-2XA0
Based on	6ES7195-7HA00-0XA0	6ES7195-7HB00-0XA0	6ES7195-7HC00-0XA0	6ES7195-7HD10-0XA0
Based on	SIPLUS_ET200M_DP_BUSMODUL	SIPLUS DP BUSMODUL ET200M 2X40	SIPLUS_ET200M_BUSMODUL	SIPLUS_ET200M_DP_BUSMODUL
Ambient conditions				
Ambient temperature in operation				
<ul style="list-style-type: none"> • Min. • max. 				-25 °C; = Tmin 70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Extended ambient conditions				
<ul style="list-style-type: none"> • Relative to ambient temperature-atmospheric pressure-installation altitude 				Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity				
<ul style="list-style-type: none"> - With condensation, tested in accordance with IEC 60068-2-38, max. 				100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
<ul style="list-style-type: none"> - against biologically active substances / conformity with EN 60721-3-3 - against chemically active substances / conformity with EN 60721-3-3 - against mechanically active substances / conformity with EN 60721-3-3 				Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation! Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation! Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

I/O systems

ET 200 systems for the control cabinet

ET 200M – Interface modules

SIPLUS IM 153-1/153-2

Ordering data	Article No.	Article No.
SIPLUS ET 200M IM 153-1 Slave interface for connecting an ET 200M to PROFIBUS DP for a maximum of 8 S7-300 modules <ul style="list-style-type: none"> Extended temperature range and exposure to media Conforms to EN 50155 	6AG1153-1AA03-2XB0 6AG1153-1AA03-2XB0	Bus module for SIPLUS ET 200M Bus module for accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover <ul style="list-style-type: none"> Extended temperature range and exposure to media
SIPLUS ET 200M IM 153-2 High Feature Slave interface for connecting an ET 200M to PROFIBUS DP for a maximum of 12 S7-300 modules; also for use in redundant systems <ul style="list-style-type: none"> Extended temperature range and exposure to media Conforms to EN 50155 	6AG1153-2BA02-7XB0 6AG1153-2BA02-2XY0	Bus module for accommodating two 40-mm wide I/O modules for the hot-swapping function <ul style="list-style-type: none"> Extended temperature range and exposure to media Bus module for accommodating one 80 mm wide I/O module for the hot swapping function <ul style="list-style-type: none"> Extended temperature range and exposure to media
		Bus module for accommodating two IM-153 modules for the hot-swapping function; for setting up redundant systems <ul style="list-style-type: none"> Extended temperature range and exposure to media
		RS 485 bus connector with 90° cable outlet Max. transfer rate 12 Mbit/s Extended temperature range and exposure to media <ul style="list-style-type: none"> without PG interface with PG interface
		Further accessories See SIMATIC ET 200M IM 153-1/153-2, page 9/272

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: Compared to the STANDARD version, also allows operation of PROFI-safe F and HART modules
- Integrated 2-port switch
- 12 modules per station
- Usable I/O quantity structure: 192 bytes 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; proximity detection).

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

For technical documentation on SIPLUS, see:
<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1153-4AA01-7XB0
Based on	6ES7153-4AA01-0XB0 SIPLUS ET200M IM 153-4 PN IO
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

Article No.

SIPLUS ET 200M IM 153-4 PN	
Slave interface for connecting an ET 200M to PROFINET for a maximum of 12 S7-300 modules	
• Extended temperature range and exposure to media	6AG1153-4AA01-7XB0
Accessories	
IE FC RJ45 Plug 180	6AG1901-1BB10-7AA0
180° cable outlet; 1 unit	
Additional accessories	See SIMATIC ET 200M interface module IM 153-4 PN, page 9/275

I/O systems

ET 200 systems for the control cabinet

ET 200M – I/O modules

Digital modules, analog modules

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 more complex tasks with analog process signals
- For connecting analog actuators and sensors without additional measuring amplifiers

For further information, see SIMATIC S7-300, chapter 5.

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

Article number	6ES7331-7TF01-0AB0 SM331, 8AI, 0/4-20MA HART
Product type designation	
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Input current	
from load voltage L+ (without load), max.	20 mA
from backplane bus 5 V DC, max.	120 mA
Output voltage	
Power supply to the transmitters	
• present	Yes
• Rated value (DC)	24 V
• short-circuit proof	Yes
Power losses	
Power loss, typ.	1.5 W
Analog inputs	
Number of analog inputs	8
permissible input current for current input (destruction limit), max.	40 mA
Input ranges	
• Current	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	240 Ω
• Input resistance (-20 mA to +20 mA)	240 Ω
• Input resistance (4 mA to 20 mA)	240 Ω
Cable length	
• shielded, max.	800 m

Article number	6ES7331-7TF01-0AB0 SM331, 8AI, 0/4-20MA HART
Analog value generation for the inputs	
Measurement principle	Sigma Delta
Integration 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
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.001 %/K
Crosstalk between the inputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.1 %
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 %
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.	40 dB
• Common mode interference, min.	100 dB

I/O systems

ET 200 systems for the control cabinet

ET 200M – I/O modules

Analog input module with HART

Technical specifications (continued)

Article number	6ES7331-7TF01-0AB0 SM331, 8AI, 0/4-20mA HART
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes
Diagnostic messages	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
Galvanic isolation	
Galvanic isolation analog inputs	
• between the channels	No
• between the channels, in groups of 8	8
• between the channels and the backplane bus	Yes
Isolation	
Isolation checked with	500
Connection method	
required front connector	20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	117 mm
Weights	
Weight, approx.	205 g

Ordering data

Ordering data	Article No.
SM 331 HART analog input module	6ES7331-7TF01-0AB0
8 inputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2 interface module	
Accessories	
Front connectors	
• 20-pin, with screw contacts	
- 1 unit	6ES7392-1AJ00-0AA0
- 100 units	6ES7392-1AJ00-1AB0
• 20-pin, with spring contacts	
- 1 unit	6ES7392-1BJ00-0AA0
- 100 units	6ES7392-1BJ00-1AB0
LK 393 cable guide	6ES7393-4AA00-0AA0
Mandatory for operation in hazardous areas	
SIMATIC DP DIN rail for ET 200M	
For mounting of up to 5 bus modules for hot-swapping function	
• Length: 483 mm (19")	6ES7195-1GA00-0XA0
• Length: 530 mm	6ES7195-1GF30-0XA0
SIMATIC S7-300 DIN rail	
• Length: 160 mm	6ES7390-1AB60-0AA0
• Length: 480 mm (19")	6ES7390-1AE80-0AA0
• Length: 530 mm	6ES7390-1AF30-0AA0
• Length: 830 mm	6ES7390-1AJ30-0AA0
• Length: 2000 mm	6ES7390-1BC00-0AA0
Label cover	6ES7392-2XY00-0AA0
(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	
Labeling strips	6ES7392-2XX00-0AA0
(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	
Labeling sheets for machine printing	
For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
petrol	6ES7392-2AX00-0AA0
light beige	6ES7392-2BX00-0AA0
yellow	6ES7392-2CX00-0AA0
red	6ES7392-2DX00-0AA0

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

Article number	6ES7332-8TF01-0AB0 SM332, 8AO, 0/4 - 20MA HART
Product type designation	
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Input current	
from load voltage L+ (without load), max.	350 mA
from backplane bus 5 V DC, max.	110 mA
Power losses	
Power loss, typ.	6 W
Analog outputs	
Number of analog outputs	8
Current output, no-load voltage, max.	24 V
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	No
• 4 mA to 20 mA	Yes
Connection of actuators	
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
Destruction limits against externally applied voltages and currents	
• Voltages at the outputs towards MANA	+60/-0.5 V
Cable length	
• shielded, max.	800 m
Analog value generation for the outputs	
Integration 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

Article number	6ES7332-8TF01-0AB0 SM332, 8AO, 0/4 - 20MA HART
Errors/accuracies	
Output ripple (based on output area, bandwidth 0 to 50 kHz), (+/-)	0.02 %
Linearity error (relative to output range), (+/-)	0.01 %
Temperature error (relative to output range), (+/-)	0.002 %/K
Crosstalk between the outputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.05 %
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 %
Interrupts/diagnostics/status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Diagnostics	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
Galvanic isolation	
Galvanic isolation analog outputs	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	Yes

I/O systems

ET 200 systems for the control cabinet

ET 200M – I/O modules

Analog output module with HART**Technical specifications (continued)**

Article number	6ES7332-8TF01-0AB0 SM332, 8AO, 0/4 - 20MA HART
Isolation	
Isolation checked with	500 V DC
Connection method	
required front connector	20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	117 mm
Weights	
Weight, approx.	220 g

Ordering data**Article No.****SM 332 HART analog output module**

HART analog output,
8 outputs, 0/4 – 20 mA,
HART for ET 200M with IM 153-2

6ES7332-8TF01-0AB0**Accessories****Front connector** (1 unit)

20-pin, with screw contacts

6ES7392-1AJ00-0AA0**LK 393 cable guide**Mandatory for operation
in hazardous areas**6ES7393-4AA00-0AA0****SIMATIC DP DIN rail for ET 200M**For mounting of up to 5 bus
modules for hot-swapping function

- Length: 483 mm
- Length: 530 mm

6ES7195-1GA00-0XA0
6ES7195-1GF30-0XA0**SIMATIC S7-300 DIN rail**

- Length: 160 mm
- Length: 480 mm
- Length: 530 mm
- Length: 830 mm
- Length: 2000 mm

6ES7390-1AB60-0AA0
6ES7390-1AE80-0AA0
6ES7390-1AF30-0AA0
6ES7390-1AJ30-0AA0
6ES7390-1BC00-0AA0**Label cover**(10 units, spare part) for signal
modules (not 32-channel modules),
function modules and CPU 312 IFM**6ES7392-2XY00-0AA0****Labeling strips**(10 units, spare part) for signal
modules (not 32-channel modules),
function modules and CPU 312 IFM**6ES7392-2XX00-0AA0****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)**6ES7998-8XC01-8YE0****S7 Manual Collection update service for 1 year**Scope of delivery: Current DVD
"S7 Manual Collection" and the
three subsequent updates**6ES7998-8XC01-8YE2****Labeling sheets for machine printing**For modules with 20-pin front
connector, DIN A4, for printing
with laser printer; 10 units

petrol

6ES7392-2AX00-0AA0

light beige

6ES7392-2BX00-0AA0

yellow

6ES7392-2CX00-0AA0

red

6ES7392-2DX00-0AA0

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

Article number	6ES7331-7TB00-0AB0 SIMATIC DP, HART ANALOG INPUT M	6ES7331-7TB10-0AB0 SIMATIC DP, HART ANALOG INPUT M
Product type designation		
Supply voltage		
Load voltage L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
Input current		
from backplane bus 5 V DC, max.	100 mA	100 mA
from supply voltage L+, max.	180 mA	180 mA
Output voltage		
Power supply to the transmitters		
• present	Yes	Yes
• Rated value (DC)	15 V; at 22 mA	15 V; at 22 mA
• short-circuit proof	Yes; approx. 30 mA	Yes; approx. 30 mA
• No-load voltage (DC)	29.6 V	29.6 V
Power losses		
Power loss, typ.	4.5 W	4.5 W
Analog inputs		
Number of analog inputs	2	2
permissible input current for current input (destruction limit), max.	40 mA	40 mA
Input ranges		
• Current	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	Yes
• Input resistance (0 to 20 mA)	50 Ω	50 Ω
• 4 mA to 20 mA	Yes	Yes
• Input resistance (4 mA to 20 mA)	50 Ω	50 Ω
Cable length		
• shielded, max.	400 m	400 m

I/O systems

ET 200 systems for the control cabinet

ET 200M – I/O modules

Ex-analog input module with HART

Technical specifications (continued)

Article number	6ES7331-7TB00-0AB0 SIMATIC DP, HART ANALOG INPUT M	6ES7331-7TB10-0AB0 SIMATIC DP, HART ANALOG INPUT M
Analog value generation for the inputs		
Measurement principle	Sigma Delta	Sigma Delta
Integration and conversion time/resolution per channel		
<ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. Integration time, parameterizable Integration time (ms) Basic conversion time, including integration time (ms) Interference voltage suppression for interference frequency f_1 in Hz 	16 bit; 10 to 15 bits + sign Yes 2,5 / 16,67 / 20 / 100 ms 2,5 / 16,67 / 20 / 100 (1 channel enabled); 7,5 / 50 / 60 / 300 (2 channels enabled) 10 / 50 / 60 / 400 Hz	16 bit; 10 to 15 bits + sign Yes 2,5 / 16,67 / 20 / 100 ms 2,5 / 16,67 / 20 / 100 (1 channel enabled); 7,5 / 50 / 60 / 300 (2 channels enabled) 10 / 50 / 60 / 400 Hz
Encoder		
Connection of signal encoders		
<ul style="list-style-type: none"> for current measurement as 2-wire transducer for current measurement as 4-wire transducer 	Yes Yes	Yes Yes
Errors/accuracies		
Linearity error (relative to input range), (+/-)	0.01 %	0.01 %
Temperature error (relative to input range), (+/-)	0.01 %/K	0.01 %/K
Crosstalk between the inputs, min.	130 dB	130 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.05 %	0.05 %
Operational limit in overall temperature range		
<ul style="list-style-type: none"> Current, relative to input area, (+/-) 	0.45 %; From 0/4 to 20 mA	0.45 %; From 0/4 to 20 mA
Basic error limit (operational limit at 25 °C)		
<ul style="list-style-type: none"> Current, relative to input area, (+/-) 	0.1 %; From 0/4 to 20 mA	0.1 %; From 0/4 to 20 mA
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, $f_1 =$ interference frequency		
<ul style="list-style-type: none"> Series mode interference (peak value of interference < rated value of input range), min. Common mode interference, min. 	60 dB 130 dB	60 dB 130 dB
Interrupts/diagnostics/status information		
Alarms		
<ul style="list-style-type: none"> Diagnostic alarm Limit value alarm 	Yes; Parameterizable Yes; Parameterizable, channels 0 and 1	Yes; Parameterizable Yes; Parameterizable, channels 0 and 1
Diagnostic messages		
<ul style="list-style-type: none"> Diagnostic functions Diagnostic information readable Overrange Wire break in signal transmitter cable Short circuit of the signal encoder cable HART communication active 	Yes; can be set in parameters, red LED, alarm message Yes Yes; Red LED, signal Yes; Red LED, signal Yes; Red LED, signal Yes; green LED (H)	Yes; Parameterizable Yes; possible Yes; Red LED, signal Yes; Red LED, signal Yes; Red LED, signal Yes; green LED (H)
Diagnostics indication LED		
<ul style="list-style-type: none"> Group error SF (red) Channel error indicator F (red) 	Yes Yes	Yes Yes

Technical specifications (continued)

Article number	6ES7331-7TB00-0AB0 SIMATIC DP, HART ANALOG INPUT M	6ES7331-7TB10-0AB0 SIMATIC DP, HART ANALOG INPUT M
Ex(i) characteristics		
Module for Ex(i) protection	Yes	Yes
Max. values of input circuits (per channel)		
• Co (permissible external capacity), max.	62 nF	62 nF
• Io (short-circuit current), max.	96.1 mA	96.1 mA
• Lo (permissible external inductivity), max.	3 mH	3 mH
• Po (power of load), max.	511 mW	511 mW
• Uo (output no-load voltage), max.	26 V	26 V
• Um (fault voltage), max.	250 V; DC	250 V; DC
• Ta (permissible ambient temperature), max.	0.6 °C	60 °C
Galvanic isolation		
between the channels and backplane bus	Yes	
Galvanic isolation analog inputs		
• Galvanic isolation analog inputs	Yes	
• between the channels		Yes
• between the channels and the backplane bus		Yes
Galvanic isolation analog outputs		
• between the channels	Yes	
• between the channels and the load voltage L+	Yes	
Permissible potential difference		
between the inputs (UCM)	60V DC/30V AC	60 V DC/30 V AC permitted potential difference (Viso) of signals from hazardous areas
Isolation tested with		
• Channels against backplane bus and load voltage L+	1500 V AC	2500 V DC
• Channels among one another	1500 V AC	2500 V DC
• Load voltage L+ against backplane bus	500 V DC	500 V DC
Standards, approvals, certificates		
CE mark		Yes
UL approval		Yes
FM approval	Available soon	Yes
RCM (formerly C-TICK)		Yes
KC approval		Yes
EAC (formerly Gost-R)		Yes
Use in hazardous areas		
• Type of protection acc. to EN 50020 (GENELEC)	[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	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4
• Test number KEMA	KEMA 97 ATEX 3039X	DEKRA 14 ATEX 0052X
• Type of protection acc. to KEMA	II 3 (2) G Eex nA [ib] IIC T4	II 3 G (2) GD Ex nA [ib Gb] [ib IIIC Db] IIC T4 Gc
Ambient conditions		
Ambient temperature in operation		
• Min.		0 °C
• max.	60 °C	60 °C
Connection method		
required front connector		1x 20-pin
Dimensions		
Width	40 mm	40 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
Weights		
Weight, approx.	260 g	260 g

I/O systems

ET 200 systems for the control cabinet

ET 200M – I/O modules

Ex-analog input module with HART

Ordering data	Article No.	Ordering data	Article No.
SM 331 HART analog input module 2 inputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2 interface module For HART protocol up to V5.0 For HART protocol V5.0 and higher	6ES7331-7TB00-0AB0 6ES7331-7TB10-0AB0	Label cover (10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	6ES7392-2XY00-0AA0
Accessories		Labeling strips (10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	6ES7392-2XX00-0AA0
Front connector¹⁾ 20-pin, with screw contacts <ul style="list-style-type: none"> • 1 unit • 100 units 	6ES7392-1AJ00-0AA0 6ES7392-1AJ00-1AB0	Labeling sheets for machine printing For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
LK 393 cable guide Mandatory for operation in hazardous areas	6ES7393-4AA00-0AA0	petrol light beige yellow red	6ES7392-2AX00-0AA0 6ES7392-2BX00-0AA0 6ES7392-2CX00-0AA0 6ES7392-2DX00-0AA0
SIMATIC DP DIN rail for ET 200M For mounting of up to 5 bus modules for <ul style="list-style-type: none"> • Length: 483 mm • Length: 530 mm 	6ES7195-1GA00-0XA0 6ES7195-1GF30-0XA0		
SIMATIC S7-300 DIN rail <ul style="list-style-type: none"> • Length: 160 mm • Length: 480 mm (19") • Length: 530 mm • Length: 830 mm • Length: 2000 mm 	6ES7390-1AB60-0AA0 6ES7390-1AE80-0AA0 6ES7390-1AF30-0AA0 6ES7390-1AJ30-0AA0 6ES7390-1BC00-0AA0		

¹⁾ A connector with spring-loaded terminals cannot be used if the cable guide is used.

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

Article number	6ES7332-5TB00-0AB0	6ES7332-5TB10-0AB0
	SM332, 2AA, 0/4 - 20mA HART	SM332, 2AA, 0/4 - 20mA HART
Product type designation		
Supply voltage		
Load voltage L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
Input current		
from load voltage L+ (without load), max.		150 mA
from backplane bus 5 V DC, max.	100 mA	100 mA
from supply voltage L+, max.	150 mA	
Power losses		
Power loss, typ.	3.5 W	3.5 W
Analog outputs		
Number of analog outputs	2	2
Voltage output, short-circuit protection	Yes	
Current output, no-load voltage, max.	19 V	19 V
Cycle time (all channels) max.	5 ms	5 ms
Output ranges, current		
• 0 to 20 mA	Yes	Yes
• -20 mA to +20 mA		No
• 4 mA to 20 mA	Yes	Yes
Connection of actuators		
• for current output two-wire connection	Yes	Yes
Load impedance (in rated range of output)		
• with current outputs, max.	650 Ω	650 Ω
• with current outputs, inductive load, max.	7.5 mH	7.5 mH
Destruction limits against externally applied voltages and currents		
• Voltages at the outputs towards MANA	max. 17 V / -0.5 V	max. 17 V / -0.5 V
• Current, max.	60 mA / -1 A	60 mA / -1 A
Cable length		
• shielded, max.	400 m	400 m

I/O systems

ET 200 systems for the control cabinet

ET 200M – I/O modules

Ex-analog output module with HART**Technical specifications** (continued)

Article number	6ES7332-5TB00-0AB0 SM332, 2AA, 0/4 - 20MA HART	6ES7332-5TB10-0AB0 SM332, 2AA, 0/4 - 20MA HART
Analog value generation for the outputs		
Integration and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	12 bit; Output value; 8 bit (+ sign) read back value	12 bit; + sign
• Conversion time (per channel)	40 ms	40 ms
Settling time		
• for resistive load	2.5 ms	2.5 ms
• for capacitive load	4 ms	4 ms
• for inductive load	2.5 ms	2.5 ms
Errors/accuracies		
Output ripple (based on output area, bandwidth 0 to 50 kHz), (+/-)	0.02 %	0.02 %
Linearity error (relative to output range), (+/-)	0.03 %	0.03 %
Temperature error (relative to output range), (+/-)	0.01 %/K	0.01 %/K
Crosstalk between the outputs, min.	130 dB	130 dB
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.005 %	0.005 %
Operational limit in overall temperature range		
• Current, relative to output area, (+/-)	0.55 %	0.55 %
Basic error limit (operational limit at 25 °C)		
• Current, relative to output area, (+/-)	0.15 %	0.15 %
Interrupts/diagnostics/ status information		
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages		
• Diagnostic functions	Yes; Parameterizable	Yes; Parameterizable
• Diagnostic information readable	Yes	Yes; possible
• Diagnostics	Yes	Yes
• Overrange	Yes	Yes
• Wire break	Yes; as of output value > 0.5 mA	Yes; as of output value > 0.5 mA
• Wire break in actuator cable	Yes	
• HART communication active	Yes; green LED (H)	Yes; green LED (H)
Diagnostics indication LED		
• Group error SF (red)	Yes; Additional group message per channel	Yes; Red LED
• Channel error indicator F (red)	Yes; per channel	Yes; per channel

Technical specifications (continued)

Article number	6ES7332-5TB00-0AB0 SM332, 2AA, 0/4 - 20MA HART	6ES7332-5TB10-0AB0 SM332, 2AA, 0/4 - 20MA HART
Ex(i) characteristics		
Module for Ex(i) protection	Yes	Yes
Max. values of output circuits (per channel)		
• Co (permissible external capacity), max.	230 nF	230 nF
• Io (short-circuit current), max.	66 mA	66 mA
• Lo (permissible external inductivity), max.	7.5 mH	7.5 mH
• Po (power of load), max.	506 mW	506 mW
• Uo (output no-load voltage), max.	19 V	19 V
• Um (fault voltage), max.	60 V; DC	60 V; DC
• Ta (permissible ambient temperature), max.	60 °C	60 °C
Galvanic isolation		
between the channels and backplane bus	Yes	
Galvanic isolation analog outputs		
• Galvanic isolation analog outputs	Yes	
• between the channels	Yes	Yes
• between the channels and the backplane bus		Yes
• between the channels and the load voltage L+	Yes	Yes
Permissible potential difference		
between the outputs (UCM)	60V DC/30V AC	60 V DC/30 V AC permitted potential difference (Viso) of signals from hazardous areas
between M internally and the outputs	60V DC/30V AC	
Isolation tested with		
• Channels against backplane bus and load voltage L+	1500 V AC	2500 V DC
• Channels among one another	1500 V AC	2500 V DC
• Load voltage L+ against backplane bus	500 V DC	500 V DC
Standards, approvals, certificates		
FM approval	Available soon	Yes
Use in hazardous areas		
• 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	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4
• Test number KEMA	97 ATEX 2359 X	DEKRA 14 ATEX 0053X
• Type of protection acc. to KEMA	II 3 (2) G Eex nA [ib] IIC T4	II 3 G (2) GD Ex nA [ib Gb] [ib IIC Db] IIC T4 Gc
Connection method		
required front connector		20-pin
Dimensions		
Width	40 mm	40 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
Weights		
Weight, approx.	280 g	290 g

I/O systems

ET 200 systems for the control cabinet
 ET 200M – I/O modules

Ex-analog output module with HART

Ordering data	Article No.	Ordering data	Article No.
SM 332 HART analog output module HART analog output, 8 outputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2 For HART protocol up to V5.0 For HART protocol V5.0 and higher	6ES7332-5TB00-0AB0 6ES7332-5TB10-0AB0	Labeling strips (10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM Software for machine labeling of modules directly from the STEP 7 project	6ES7392-2XX00-0AA0
Accessories		Labeling sheets for machine printing For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Front connectors 20-pin, with screw contacts <ul style="list-style-type: none"> • 1 unit • 100 units 	6ES7392-1AJ00-0AA0 6ES7392-1AJ00-1AB0	petrol light beige yellow red	6ES7392-2AX00-0AA0 6ES7392-2BX00-0AA0 6ES7392-2CX00-0AA0 6ES7392-2DX00-0AA0
LK 393 cable guide Mandatory for operation in hazardous areas	6ES7393-4AA00-0AA0	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)	6ES7998-8XC01-8YE0
SIMATIC DP DIN rail for ET 200M For mounting of up to 5 bus modules for hot-swapping function <ul style="list-style-type: none"> • Length: 483 mm (19") • Length: 530 mm 	6ES7195-1GA00-0XA0 6ES7195-1GF30-0XA0	S7 Manual Collection update service for 1 year Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	6ES7998-8XC01-8YE2
SIMATIC S7-300 DIN rail <ul style="list-style-type: none"> • Length: 160 mm • Length: 480 mm (19") • Length: 530 mm • Length: 830 mm • Length: 2000 mm 	6ES7390-1AB60-0AA0 6ES7390-1AE80-0AA0 6ES7390-1AF30-0AA0 6ES7390-1AJ30-0AA0 6ES7390-1BC00-0AA0		
Label cover (10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	6ES7392-2XY00-0AA0		

Overview



- Can only be plugged into 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1331-7TF01-7AB0
Based on	6ES7331-7TF01-0AB0 SIPLUS SM331 AI 8 X 0/4...20MA HART
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL use
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

SIPLUS SM 331 analog input module with HART
8 inputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2 interface module

Extended temperature range and exposure to media

Accessories

Article No.

6AG1331-7TF01-7AB0

See SIMATIC ET 200M analog module with HART, page 9/282

I/O systems

ET 200 systems for the control cabinet

ET 200M – 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 AO HART
- Redundant connection
- Firmware update
- HART secondary variables

Note:

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

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1332-8TF01-2AB0
Based on	6ES7332-8TF01-0AB0 SIPLUS SM332 8AO HART
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

SIPLUS SM 332 analog output module with HART

8 outputs, 0/4...20 mA HART, for ET 200M with IM 153-2 interface module

Extended temperature range and exposure to media

Accessories

Article No.

6AG1332-8TF01-2AB0

See SIMATIC SM 332 analog output module with HART, page 9/284

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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1331-7TB00-7AB0
Based on	6ES7331-7TB00-0AB0 SIPLUS S7-300 SM331 2AE HART
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

Article No.

SIPLUS SM 331 Ex analog input module with HART

2 inputs, 0/4 ... 20 mA, HART for ET 200M with IM 153-2 interface module

Extended temperature range and exposure to media

Accessories

6AG1331-7TB00-7AB0

See SIMATIC ET 200M Ex analog input module with HART, page 9/288

I/O systems

ET 200 systems for the control cabinet

ET 200M – I/O modules

Function modules**Overview**

Function modules relieve 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
	FM 350-2 counter module
Positioning	• of rapid traverse and creep speed drives
	• of stepper motors
	• of servo motors
Position and path control	FM 351 positioning module
SSI position detection	FM 353 positioning module
	FM 354 positioning module
Electronic cam control	FM 357-2 path and position control module ¹⁾
High speed logic operation	SM 338 POS input modules
Controlling	FM 352 electronic cam controller
	FM 355-5 high speed Boolean processor
Weighing and proportioning electronics	FM 355 controller module
	FM 355-2 temperature controller module
	SIWAREX

¹⁾ 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	Article No.	For plugging in behind IM 153-1 (6ES7153-1AA03-0XB0)		For plugging in behind IM 153-2 (6ES7153-2BA02-0XB0)		For plugging in behind IM 153-2 FO (6ES7153-2BB00-0XB0)		For plugging in behind IM 153-4 PN (6ES7153-4AA00-0XB0)
		STEP 7 ¹⁾	GSD ²⁾	STEP 7 ¹⁾	GSD ²⁾	STEP 7 ¹⁾	GSD ²⁾	STEP 7 ¹⁾
FM 350-1 counter module	6ES7350-1AH03-0AE0	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 350-2 counter module	6ES7350-2AH01-0AE0	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 351 positioning module	6ES7351-1AH01-0AE0	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 352 cam controller	6ES7352-1AH02-0AE0	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 352-5 high speed Boolean processor	6ES7352-5AH00-0AE0	<input checked="" type="checkbox"/> ³⁾	<input type="checkbox"/>	<input checked="" type="checkbox"/> ³⁾	<input type="checkbox"/>	<input checked="" type="checkbox"/> ³⁾	<input type="checkbox"/>	<input type="checkbox"/>
FM 352-5 high speed Boolean processor	6ES7352-5AH10-0AE0	<input checked="" type="checkbox"/> ³⁾	<input type="checkbox"/>	<input checked="" type="checkbox"/> ³⁾	<input type="checkbox"/>	<input checked="" type="checkbox"/> ³⁾	<input type="checkbox"/>	<input type="checkbox"/>
FM 353 positioning module	6ES7353-1AH01-0AE0	--	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	--
FM 354 positioning module	6ES7354-1AH01-0AE0	--	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	--
FM 355 C controller module	6ES7355-0VH10-0AE0	--	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 355 S controller module	6ES7355-1VH10-0AE0	--	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 355-2 C temperature controller module	6ES7355-2CH00-0AE0	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 355-2 S temperature controller module	6ES7355-2SH00-0AE0	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
SM 338 POS input module	6ES7338-4BC01-0AB0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

: configurable

--: not configurable

¹⁾ 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).

²⁾ 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.

³⁾ 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.

<http://www.siemens.com/simatic-technology>

For further information, see SIMATIC S7-300, chapter 5.

I/O systems

ET 200 systems for the control cabinet
ET 200M – I/O modules

Special modules, Communication

Overview Special modules



The special modules provide the user with functions for diagnostics, as well as commissioning.

For further information, see SIMATIC S7-300, chapter 5.

Overview Communication



- Communication boards for data exchange using point-to-point coupling
- Communication board for the connection of identification systems

For further information, see SIMATIC S7-300, chapter 5.

Overview



The ASM 475 is a powerful 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

Article No.	6GT2002-0GA10
Product-type designation	ASM 475 communication module
Suitability for installation	SIMATIC S7-300, ET200M in conjunction with RF200/300/600, MOBY D/E//U, MV
Transmission rate at point-to-point connection serial maximum	115.2 kbit/s
Interfaces	
Design of interface for point-to-point connection	RS422
Number of readers connectable	2
Design of electrical connection	
• of the backplane bus	S7-300 backplane bus
• of the PROFIBUS interface	(according to the head module)
• the Industrial Ethernet Interface	(according to the head module)
• for supply voltage	Screw-type or spring-loaded terminals
Version of the interface to the reader for communication	Screw-type or spring-loaded terminals
Mechanical data	
Material	Noryl
Color	Anthraxite
Supply voltage, current consumption, power loss	
Supply voltage for DC	
• rated value	24 V
• minimum	20 V
• maximum	30 V
Current consumed at 24 V DC	
• without connected devices typical	0.1 A
• including connected devices maximum	1 A
Permitted ambient conditions	
Ambient temperature	
• during operating	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Protection class IP	IP 20
Resistance against shock	According to IEC 61131-2
Resistance against shock	150 m/s ²
Resistance against vibration	10 m/s ²

Article No.	6GT2002-0GA10
Product-type designation	ASM 475 communication module
Design, dimensions and weight	
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.2 kg
Mounting type	S7-300 rack
Cable length for RS 422 interface maximum	1000 m
Product properties, functions, components general	
Type of display	4 LEDs per reader connection, 2 LEDs for device status
Product function transponder file handler can be addressed	Yes
Protocol is supported S7 communication	Yes
Product functions management, configuration	
Type of parameterization	Object manager, GSD
Type of programming	FB 45, FB 55, FC 56 (FC 45/55 with limited functionality)
Type of computer-mediated communication	acyclic communication
Standards, specifications, approvals	
Verification of suitability	CE, FCC, UL/CSA
Accessories	
Accessories	Front connector with screw-type or spring-loaded terminals

I/O systems

ET 200 systems for the control cabinet
 ET 200M – I/O modules – Communication

ASM 475**Ordering data****Article No.****Article No.****ASM 475 communication module****6GT2002-0GA10**

For SIMATIC S7-300 and ET 200M,
 parameterizable

Accessories**Front connector
(1 x per ASM 475)**

- with screw terminals
- with spring-loaded terminals

6ES7392-1AJ00-0AA0**6ES7392-1BJ00-0AA0****MOBY U connecting cable**

Pre-assembled,
 between the ASM 475 and reader,
 angled connector, PUR material,
 in the following lengths:

2 m

6GT2091-4EH20

5 m

6GT2091-4EH50

10 m

6GT2091-4EN10

20 m

6GT2091-4EN20

50 m

6GT2091-4EN50**MOBY D connecting cable**

Pre-assembled, between ASM 475
 and reader D1xS,
 9-pin sub D plug, PUR material,
 CMG approval, suitable for cable
 carriers, in the following lengths:

5 m

6GT2491-4EH50

20 m

6GT2491-4EN20

50 m

6GT2491-4EN50**SIMATIC RF200 / RF300 / RF600 /
MV400 connecting cable**

Pre-assembled,
 between the ASM 475 and RF200 /
 RF300 / RF600 / MV400, IP65,
 straight connector, PUR material,
 suitable for cable carriers, CMG
 approval, in the following lengths¹⁾:

2 m

6GT2891-4EH20

5 m

6GT2891-4EH50**Extension cable**

SIMATIC RF200 / RF300 / RF600 /
 MV400, PUR material,
 CMG approval, suitable for cable
 carriers, straight connector

2 m

6GT2891-4FH20

5 m

6GT2891-4FH50

10 m

6GT2891-4FN10

20 m

6GT2891-4FN20

50 m

6GT2891-4FN50**DVD "RFID Systems Software &
Documentation"****6GT2080-2AA20**

¹⁾ The connecting cables can be extended using 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.

Overview



- Load current supplies for S7-300/ET 200M
- For converting the line voltage to the required operating voltage (24V DC)
- Output current 2 A, 5 A or 10 A

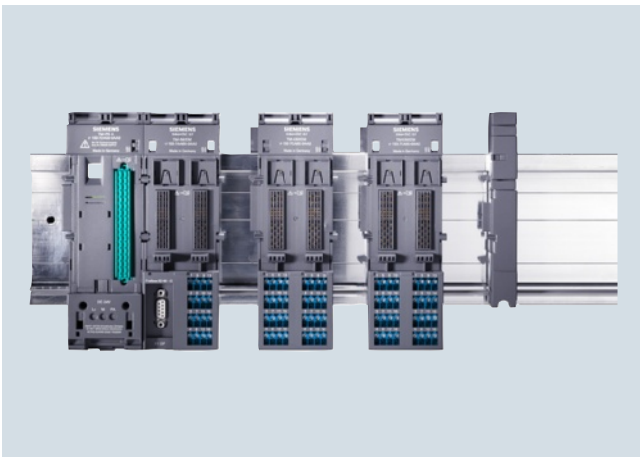
[For further information, see SIMATIC S7-300, chapter 5.](#)

I/O systems

ET 200 systems for the control cabinet
ET 200iSP

Introduction

Overview



- Failsafe 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)
- Failsafe 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 diagnostics 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		General	
Degree of protection	IP30		
Ambient temperature	-20°C ... +70°C		
Medial load	In accordance with ISA-S71.04 severity level G1 ;G2 ;G3 (with the exception of NH3 here only Level G2)		
EMC	Electromagnetic compatibility in accordance with NE21		
Vibration-proof	0.5 g continuously, 1 g periodically		
Approvals, standards			
• ATEX	II 2 G (1) GD I M2	Ex de [ia/ib] IIC T4	Class I Zone 1, AEx de [ia/ib] IIC T4
• IECEx	Zone 1	Ex de [ia/ib] I Ex de [ia/ib] IIC T4	Class I,II,II Division 2, Groups A, B, C, D, E, F, G T4 providing int. safe circuits for Division 1, Groups A, B, C, D, E, F, G
• INMETRO	Zone 1	BR-Ex de [ia/ib] IIC T4	
• cFMus	Class I,II,II	NI Division 2, Groups A, B, C, D, E, F, G T4 AIS Division 1, Groups A, B, C, D, E, F, G	Class I Zone 1, AEx de [ia/ib] IIC T4
			EN 50170, Volume 2 IEC 61131, Part 2 In accordance with 94/9/EG (ATEX 100a), 89/336/EEC and 73/23/EEC Classification companies • ABS (American Bureau of Shipping) • BV (Bureau Veritas) • DNV (Det Norske Veritas) • GL (Germanischer Lloyd) • LRS (Lloyds Register of Shipping) • Class NK (Nippon Kaiji Kyokai)
		• PROFIBUS • IEC • CE • Shipbuilding approval	

I/O systems

ET 200 systems for the control cabinet
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 152s 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 using a 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

Article number	6ES7152-1AA00-0AB0 ET200iSP, IM152-1 INTERFACE MODULE
Product type designation	
General information	
Vendor identification (VendorID)	8110H
Input current	
from supply voltage 1L+, max.	30 mA
Power losses	
Power loss, typ.	0.5 W
Time stamping	
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
Interfaces	
Interface physics, RS 485	Yes; intrinsically safe
PROFIBUS DP	
• Transmission rate, max.	1.5 Mbit/s; 9,6 / 19,2 / 45,45 / 93,75 / 187,5 / 500 kbit/s
• SYNC capability	Yes
• FREEZE capability	Yes
• Direct data exchange (slave-to-slave communication)	Yes; Slave to slave as publisher
Protocols	
PROFIBUS DP	Yes
Protocols (Ethernet)	
• TCP/IP	No
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No

Article number	6ES7152-1AA00-0AB0 ET200iSP, IM152-1 INTERFACE MODULE
Interrupts/diagnostics/status information	
Alarms	
• Alarms	Yes
• Acyclic function, interrupts	Yes
• Acyclic function, parameters	Yes
Diagnostic messages	
• Diagnostic functions	Yes
Diagnostics indication LED	
• Bus fault BF (red)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
Galvanic isolation	
between supply voltage and electronics	Yes
Standards, approvals, certificates	
CE mark	Yes
Use in hazardous areas	
• 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
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	245 g

Technical specifications (continued)

Article number	6ES7193-7AA00-0AA0 ET200iSP, TERM.-MOD. TM-IM/EM60S, SCREW	6ES7193-7AA10-0AA0 ET200iSP, TERM.-MOD. TM-IM/EM60C, SPRING	6ES7193-7AB00-0AA0 ET200iSP, TERM.-MOD. TM-IM/IM F. TWO IM
Product type designation			
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
Use in hazardous areas			
• Type of protection acc. to EN 50020 (CENELEC)	see ET200iSP system	see ET200iSP system	see ET200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	04 ATEX 2242
Dimensions			
Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm
Weights			
Weight, approx.	235 g	235 g	195 g

Ordering data

Article No.	Article No.
IM152 • ET 200iSP-IM152-1	6ES7152-1AA00-0AB0
Terminal module for IM152 incl. termination module • TM-IM/EM60S • TM-IM/EM60C • TM-IM/IM	6ES7193-7AA00-0AA0 6ES7193-7AA10-0AA0 6ES7193-7AB00-0AA0
Accessories	
Connectors PROFIBUS connector with active terminating resistor For RS 485-IS circuit; 1.5 Mbit/s	6ES7972-0DA60-0XA0
RS 485-IS coupler Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS	6ES7972-0AC80-0XA0
Labeling sheets DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules, and 20 strips each for IM 152 • petrol • yellow	6ES7193-7BH00-0AA0 6ES7193-7BB00-0AA0
Labels, inscribed Ordering unit 1 set with 200 pieces each for slot numbering • 200 items, 10 x slots 1 to 2 • 200 items, 5 x slots 1 to 40 • 100 items for slot numbering, inscription in plain text	8WA8861-0AB 8WA8861-0AC 8WA8848-0XA
Labels, blank Ordering unit 1 set with 200 pieces each for slot numbering	8WA8848-2AY
S7-300 DIN rails Standard rail 585 mm Standard rail 885 mm	6ES7390-1AF85-0AA0 6ES7390-1AJ85-0AA0
Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e Empty enclosure without installation of modules, for use in 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 gaseous area, with 3 rows of M16 cable glands (41 units) and 2 rows of blanking plugs 6DL2804-0AD30 • 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) 6DL2804-0AD50 • 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 6DL2804-0AE30 • 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) 6DL2804-0AE50 Empty enclosure without installation of modules, for use in dust area, IP65 • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs 6DL2804-0DD30 • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (66 units) 6DL2804-0DD50 • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs 6DL2804-0DE30 • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (111 units) 6DL2804-0DE50	

I/O systems

ET 200 systems for the control cabinet

ET 200iSP

IM 152-1 interface module**Ordering data****Article No.****Article No.**

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 glands (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)

6DL2804-1AD30**6DL2804-1AD50****6DL2804-1AE30****6DL2804-1AE50**

Enclosure with installation of modules, for use in dust 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 dust 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 dust 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 dust 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 dust area, with 5 rows of M16 cable entries (111 units)

6DL2804-1DD30**6DL2804-1DD50****6DL2804-1DE30****6DL2804-1DE50**

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 a 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
 - powerbus (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

Article number	6ES7138-7EA01-0AA0	6ES7138-7EC00-0AA0
	ET200iSP, POWER SUPPLY MODULE	ET200iSP, POWER SUPPLY MOD. AC120/230V
Product type designation		
Supply voltage		
Load voltage L+		
• Rated value (DC)	24 V	
• Reverse polarity protection	Yes	
Load voltage L1		
• Rated value (AC)		230 V; 120/230V 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
Input current		
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
Power losses		
Power loss, typ.	20 W	5 W; 5 W + 1.2 x total power loss of the electronics modules
Power loss, max.	20 W	21.3 W
Interrupts/diagnostics/status information		
Status indicator	Yes	Yes
Alarms		
• Alarms	No	No
Diagnostic messages		
• Diagnostic information readable	Yes; via IM 152	Yes; via IM 152
Diagnostics indication LED		
• Group error SF (red)	No	No
Ex(i) characteristics		
Max. values of input circuits (per channel)		
• Um (fault voltage), max.	250 V; DC	264 V; AC/DC
Galvanic isolation		
primary/secondary	Yes	Yes
between supply voltage and electronics	Yes	No

I/O systems

ET 200 systems for the control cabinet
ET 200iSP

Power supply units**Technical specifications (continued)**

Article number	6ES7138-7EA01-0AA0 ET200iSP, POWER SUPPLY MODULE	6ES7138-7EC00-0AA0 ET200iSP, POWER SUPPLY MOD. AC120/230V		
Standards, approvals, certificates				
CE mark	Yes	Yes		
Use in hazardous areas				
• 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		
Dimensions				
Width	60 mm	60 mm		
Height	190 mm	190 mm		
Depth	136.5 mm	136.5 mm		
Weights				
Weight, approx.	2 700 g	2 700 g		
Article number	6ES7193-7DA10-0AA0 ET200iSP, TERMINAL-MOD. TM-PS-A F. PS	6ES7193-7DB10-0AA0 ET200iSP, TERMINAL-MOD. TM-PS-A F. PS	6ES7193-7DA20-0AA0 ET200iSP, TERM.-MOD. TM-PS-A UC	6ES7193-7DB20-0AA0 ET200iSP, TERM.-MOD. TM-PS-B UC
Product type designation				
Standards, approvals, certificates				
CE mark			Yes	Yes
Use in hazardous areas				
• Type of protection acc. to EN 50020 (CENELEC)	see ET200iSP system	see ET200iSP system	see ET200iSP system	see ET200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	04 ATEX 2242	04 ATEX 2242
Dimensions				
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
Weights				
Weight, approx.			230 g	230 g

Ordering data**Article No.**

Power supply module PS 24 V DC	6ES7138-7EA01-0AA0
Terminal module TM-PS-A Standard	6ES7193-7DA10-0AA0
Terminal module TM-PS-B for redundant operation	6ES7193-7DB10-0AA0
Power supply module PS 120/230 V AC	6ES7138-7EC00-0AA0
Terminal module TM-PS-A UC Standard	6ES7193-7DA20-0AA0
Terminal module TM-PS-B UC for redundant operation	6ES7193-7DB20-0AA0

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 and uniquely mechanically coded
- Modules can be replaced under potentially explosive conditions during runtime.

Technical specifications

Article number	6ES7131-7RF00-0AB0 ET200iSP, EL-MOD., 8DI, NAMUR
Product type designation	
Supply voltage	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Digital inputs	
Number of digital inputs	8
Number of NAMUR inputs	8
Input voltage	
• Type of input voltage	DC
Input delay (for rated value of input voltage) for standard inputs	
- at "0" to "1", min.	2.8 ms
- at "0" to "1", max.	3.5 ms
- at "1" to "0", min.	2.8 ms
- at "1" to "0", max.	3.5 ms
Cable length	
• shielded, max.	500 m
Encoder	
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
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	No
Diagnostic messages	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Short circuit	Yes; R load < 150 ohms with NAMUR sensor/sensor and NAMUR changeover contact/sensor to DIN 19234
Diagnostics indication LED	
• Group error SF (red)	Yes

Article number	6ES7131-7RF00-0AB0 ET200iSP, EL-MOD., 8DI, NAMUR
Integrated Functions	
Frequency meter	Yes
Frequency measurement	Yes; (Gate time) 50 ms; 200 ms; 1 s
Number of frequency meters	2
Counter	
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
Galvanic isolation	
Galvanic isolation digital inputs	
• between the channels	No
• between the channels and the backplane bus	Yes
Permissible potential difference	
between different circuits	60V DC/30V AC
Standards, approvals, certificates	
CE mark	Yes
Use in hazardous areas	
• 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 1248
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	255 g

I/O systems

ET 200 systems for the control cabinet
ET 200iSP

Digital electronic modules**Technical specifications (continued)**

Article number	6ES7132-7RD01-0AB0 ET200iSP, EL-MOD., 4DO, DC 23,1V, 20MA	6ES7132-7RD11-0AB0 ET200iSP, EL-MOD., 4DO, DC 17,4V, 27MA	6ES7132-7RD22-0AB0 ET200iSP, EL-MOD., 4DO, DC 17.4V, 40MA
Product type designation			
Input current			
from load voltage L+ (without load), max.	340 mA; with actuator supply	300 mA	400 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA	
Power losses			
Power loss, typ.	2.5 W	2.1 W	2.8 W
Address area			
Address space per module			
• without packing	2 byte	2 byte	2 byte
Digital inputs			
Cable length			
• shielded, max.			20 m
• Unshielded, max.			20 m
Digital outputs			
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	Yes	Yes
No-load voltage U _{ao} (DC)	23.1 V	17.4 V	17.4 V
Internal resistor R _i	275 Ω	150 Ω	167 Ω
Trend key points E			
• Voltage U _e (DC)	17.1 V	13.2 V	10.7 V
• Current I _e	20 mA	27 mA	40 mA; 80 mA when outputs connected in parallel
Output current			
• for signal "1" rated value	0.02 A	0.027 A	0.04 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			
• shielded, max.	500 m	500 m	500 m
• Unshielded, max.	500 m	500 m	500 m
Interrupts/diagnostics/status information			
Status indicator	Yes	Yes	Yes
Alarms			
• Alarms		No	
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages			
• Diagnostic functions	Yes	Yes	
• Diagnostic information readable	Yes	Yes	Yes
• Wire break	Yes; R > 10 kohms, I < 100 μA	Yes	Yes; R > 10 kohms, I < 100 μA
• Short circuit	Yes; R < 800 ohms (one output), R < 40 ohms (outputs connected in parallel)	Yes	Yes; R < 80 Ohm (one output), R < 40 Ohm (outputs connected in parallel)
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes; Per channel

Technical specifications (continued)

Article number	6ES7132-7RD01-0AB0 ET200iSP, EL-MOD., 4DO, DC 23,1V, 20MA	6ES7132-7RD11-0AB0 ET200iSP, EL-MOD., 4DO, DC 17,4V, 27MA	6ES7132-7RD22-0AB0 ET200iSP, EL-MOD., 4DO, DC 17.4V, 40MA
Parameter			
Remark		14 byte	
Diagnosis: wire break	Yes	Yes	Yes
Diagnosis: short circuit	Yes	Yes	Yes
Behavior on CPU/Master STOP, channel-wise	Substitute a value/keep last value	Substitute a value/keep last value	Substitute a value/keep last value
Ex(i) characteristics			
Max. values of output circuits (per channel)			
• Co (permissible external capacity), max.			241 nF; For IIC, 1507 nF for IIB
• Io (short-circuit current), max.			118 mA
• Lo (permissible external inductivity), max.			1.7 mH; For IIC, 10.4 mH for IIB
• Po (power of load), max.			572 mW
• Uo (output no-load voltage), max.			19.4 V
• Ta (permissible ambient temperature), max.	70 °C	70 °C	
Galvanic isolation			
Galvanic isolation digital 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
Permissible potential difference between different circuits			60V DC/30V AC
Standards, approvals, certificates			
CE mark			Yes
Highest safety class achievable in safety mode			
• SIL according to IEC 61508	No		No
Use in hazardous areas			
• 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	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1249	04 ATEX 1249	04 ATEX 1249
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
Weights			
Weight, approx.	255 g	255 g	255 g

I/O systems

ET 200 systems for the control cabinet

ET 200iSP

Digital electronic modules

Technical specifications (continued)

Article number	6ES7132-7GD00-0AB0 ET200iSP, EL-MOD., 4DO, DC 23,1V, 20MA	6ES7132-7GD10-0AB0 ET200iSP, EL-MOD., 4DO, DC 17,4V, 27MA	6ES7132-7GD21-0AB0 ET200iSP, EL-MOD., 4DO, DC 17,4V, 40MA	6ES7132-7GD30-0AB0 ET200iSP, EL-MOD., 4DO, DC 25.5V, 22MA
Product type designation				
Input current				
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		
Power losses				
Power loss, typ.	2.5 W	2.1 W	2.8 W	2.8 W
Address area				
Address space per module				
• without packing	2 byte	2 byte	2 byte	2 byte
Digital inputs				
Cable length				
• shielded, max.			20 m	20 m
• Unshielded, max.			20 m	20 m
Digital outputs				
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	Yes	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 Ω	167 Ω	260 Ω
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
Output current				
• for signal "1" rated value	0.02 A	0.027 A	0.04 A	0.022 A
Output delay with resistive load				
• "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
Parallel switching of 2 outputs				
• for increased power	No; for Ex reasons not possible; nor for predecessor	Yes	Yes	No
Switching frequency				
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz	2 Hz
Cable length				
• shielded, max.	500 m	500 m	500 m	500 m
• Unshielded, max.	500 m	500 m	500 m	500 m
Interrupts/diagnostics/status information				
Status indicator	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages				
• Diagnostic functions	Yes	Yes	Yes	Yes
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Wire break	Yes; R > 10 kohms, I < 100 μA	Yes; R > 10 kohms, I < 100 μA	Yes; R > 10 kohms, I < 100 μA	Yes; R > 10 kohms, I < 100 μA
• Short circuit	Yes; R < 80 Ohm (one output), R < 40 Ohm (outputs connected in parallel)	Yes; R < 80 ohms (one output), R < 40 ohms (outputs connected in parallel)	Yes; R < 80 Ohm (one output), R < 40 Ohm (outputs connected in parallel)	Yes; R < 80 ohms
Diagnostics indication LED				
• Group error SF (red)	Yes	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes; Per channel	Yes; Per channel

Technical specifications (continued)

Article number	6ES7132-7GD00-0AB0 ET200iSP, EL-MOD., 4DO, DC 23,1V, 20MA	6ES7132-7GD10-0AB0 ET200iSP, EL-MOD., 4DO, DC 17,4V, 27MA	6ES7132-7GD21-0AB0 ET200iSP, EL-MOD., 4DO, DC 17,4V, 40MA	6ES7132-7GD30-0AB0 ET200iSP, EL-MOD., 4DO, DC 25.5V, 22MA
Parameter				
Remark	14 byte	14 byte		
Diagnosis: wire break	Yes	Yes	Yes	Yes
Diagnosis: short circuit	Yes	Yes	Yes	Yes
Behavior on CPU/Master STOP, channel-wise	Substitute a value/keep last value	Substitute a value/keep last value	Substitute a value/keep last value	Substitute a value/keep last value
Ex(i) characteristics				
Max. values of output circuits (per channel)				
• Co (permissible external capacity), max.			241 nF; For IIC, 1507 nF for IIB	81 nF; For IIC, 651 nF for IIB
• Io (short-circuit current), max.			118 mA	110 mA
• Lo (permissible external inductivity), max.			1.7 mH; For IIC, 10.4 mH for IIB	1.7 mH; For IIC, 11.5 mH for IIB
• Po (power of load), max.			572 mW	764 mW
• Uo (output no-load voltage), max.			19.4 V	27.9 V
• Ta (permissible ambient temperature), max.	70 °C	70 °C		
Galvanic isolation				
Galvanic isolation digital outputs				
• 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	Yes	Yes	Yes
Permissible potential difference between different circuits			60V DC/30V AC	60V DC/30V AC
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
Highest safety class achievable in safety mode				
• SIL according to IEC 61508	No	No	No	No
Use in hazardous areas				
• 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	04 ATEX 1249	04 ATEX 1249	04 ATEX 1249	04 ATEX 1249
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
Weights				
Weight, approx.	255 g	255 g	255 g	255 g

I/O systems

ET 200 systems for the control cabinet

ET 200iSP

Digital electronic modules

Technical specifications (continued)

Article number	6ES7132-7HB00-0AB0 ET200iSP, RELAY-MOD., 2DO, UC60V, 2A
Product type designation	
Input current	
from load voltage L+ (without load), max.	120 mA
Power losses	
Power loss, typ.	1 W
Digital outputs	
Number of digital outputs	2
short-circuit protection	Yes
Output current	
• for signal "1" rated value	2 A
Output delay with resistive load	
• "0" to "1", max.	8 ms
• "1" to "0", max.	3 ms
Parallel switching of 2 outputs	
• for increased power	No
• for redundant control of a load	No
Switching frequency	
• with resistive load, max.	0.5 Hz; See data in manual
• with inductive load, max.	0.2 Hz; See data in manual
Relay outputs	
Switching capacity of contacts	
- at ohmic load, up to 60 °C, max.	2 A; See data in manual
- Thermal continuous current, max.	2 A; See data in manual
Cable length	
• shielded, max.	500 m
• Unshielded, max.	500 m
Interrupts/diagnostics/ status information	
Status indicator	Yes
Substitute values connectable	Yes
Alarms	
• Alarms	No
• Diagnostic alarm	Yes
• Hardware interrupt	No

Article number	6ES7132-7HB00-0AB0 ET200iSP, RELAY-MOD., 2DO, UC60V, 2A
Diagnostic messages	
• Diagnostic information readable	Yes
• Wire break	No; Cannot be determined in contact power circuit
• Short circuit	No; Cannot be determined in contact power circuit
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes; Per channel
Ex(i) characteristics	
Max. values of output circuits (per channel)	
• U _o (output no-load voltage), max.	60 V
• U _m (fault voltage), max.	250 V
• T _a (permissible ambient temperature), max.	70 °C
Galvanic isolation	
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; Channels and power bus
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• SIL according to IEC 61508	No
Use in hazardous areas	
• 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
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	280 g

Technical specifications (continued)

Article number	6ES7193-7CA00-0AA0	6ES7193-7CA10-0AA0	6ES7193-7CB00-0AA0
	ET200iSP, TERM.-MOD. TM-EM/ EM60S F. EM	ET200iSP, TERM.-MOD. TM-EM/ EM60C F. EM	ET200iSP, TERM.-MOD. TM-RM/RM
Product type designation			
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
Use in hazardous areas			
• Type of protection acc. to EN 50020 (CENELEC)	see ET200iSP system	see ET200iSP system	see ET200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	07 ATEX 0205
Dimensions			
Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm
Weights			
Weight, approx.	275 g	275 g	340 g

Ordering data

Ordering data	Article No.	Ordering data	Article No.
Digital input modules		Accessories	
8 x DI NAMUR		Connector	
Digital input module 8 DI NAMUR	6ES7131-7RF00-0AB0	PROFIBUS connector with active terminating resistor	6ES7972-0DA60-0XA0
Digital output modules for EEX i		For RS 485-IS circuit; 1.5 Mbit/s	
4 x DO; 1 additional intrinsically safe input for "H" shut-off		RS 485-IS coupler	6ES7972-0AC80-0XA0
Digital output module 4 DO 23.1 V DC/20 mA	6ES7132-7RD01-0AB0	Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS	
Digital output module 4 DO 17.4 V DC/27 mA	6ES7132-7RD11-0AB0	Labeling sheets	
Digital output module 4 DO 17.4 V DC/40 mA	6ES7132-7RD22-0AB0	DIN A4, perforated, each consisting of 10 sheets of 30 strips each, used for electronic modules and 20 strips, used for IM 151	
4 x DO; 1 additional intrinsically safe input for "L" shut-off		• petrol	6ES7193-7BH00-0AA0
Digital output module 4 DO 23.1 V DC/20 mA	6ES7132-7GD00-0AB0	• yellow	6ES7193-7BB00-0AA0
Digital output module 4 DO 17.4 V DC/27 mA	6ES7132-7GD10-0AB0	Labels, inscribed	
Digital output module 4 DO 17.4 V DC/40 mA	6ES7132-7GD21-0AB0	Ordering unit 1 set with 200 pieces each for slot numbering	
Digital output module 4 DO 25.4 V DC/22 mA	6ES7132-7GD30-0AB0	• 10 x slots 1 to 2	8WA8861-0AB
Digital output modules for EEX e		• 5 x slots 1 to 40	8WA8861-0AC
Digital output module 2 DO relay, 60 V UC, 2 A	6ES7132-7HB00-0AB0	Labels, blank	8WA8848-2AY
Terminal modules		Ordering unit 1 set with 200 pieces each for slot numbering	
TM-EM/EM60S	6ES7193-7CA00-0AA0	S7-300 DIN rails	
For accommodating all electronic modules except 2 DO relay; screw-type terminals		Standard rail 585 mm	6ES7390-1AF85-0AA0
TM-EM/EM60C	6ES7193-7CA10-0AA0	Standard rail 885 mm	6ES7390-1AJ85-0AA0
For accommodating all electronic modules except 2 DO relay; spring-loaded terminals			
TM-RM/RM 60S	6ES7193-7CB00-0AA0		
For accommodating digital output module 2 DO relay and reserve modules; screw-type terminal			

I/O systems

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Digital electronic modules

Ordering data

Article No.

Article No.

Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e

Empty enclosure without installation of modules, for use in 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 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)

Empty enclosure without installation of modules, for use in dust area, IP65

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust 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 dust 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 dust 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 dust area, with 5 rows of M16 cable entries (111 units)

6DL2804-0AD30

6DL2804-0AD50

6DL2804-0AE30

6DL2804-0AE50

6DL2804-0DD30

6DL2804-0DD50

6DL2804-0DE30

6DL2804-0DE50

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)

Enclosure with installation of modules, for use in dust 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 dust 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 dust 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 dust 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 dust area, with 5 rows of M16 cable entries (111 units)

6DL2804-1AD30

6DL2804-1AD50

6DL2804-1AE30

6DL2804-1AE50

6DL2804-1DD30

6DL2804-1DD50

6DL2804-1DE30

6DL2804-1DE50

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 and uniquely mechanically coded
- Modules can be replaced under potentially explosive conditions during runtime

Technical specifications

Article number	6ES7134-7SD00-0AB0	6ES7134-7SD51-0AB0	6ES7134-7TD00-0AB0	6ES7134-7TD50-0AB0
	ET200iSP, EL-MOD., 4 AI TC	ET200iSP, EL-MOD., 4 AI RTD, PT100/NI100	ET200iSP, EL-MOD., 4 AI, HART, 2-WIRE	ET200iSP, EL-MOD., 4 AI, HART, 4-WIRE
Product type designation				
Input current				
from supply voltage L+, max.	30 mA	22 mA	320 mA	30 mA
Output voltage				
Power supply to the transmitters				
• short-circuit proof			Yes	
• Supply current, max.			23 mA; per channel	
Power losses				
Power loss, typ.	0.4 W	0.4 W	2.7 W	0.4 W
Analog inputs				
Number of analog inputs	4	4	4	4
permissible input current for current input (destruction limit), max.			90 mA	50 mA
Cycle time (all channels) max.	320 ms	320 ms	120 ms; 30 ms basic conversion time x 4 channels with 60 Hz, 50 Hz interference frequency suppression	120 ms; 30 ms basic conversion time x 4 channels with 60 Hz, 50 Hz interference frequency suppression
Technical unit for temperature measurement adjustable	Yes	Yes	Yes	Yes
Input ranges				
• 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				
• -80 mV to +80 mV	Yes			
• Input resistance (-80 mV to +80 mV)	1 000 kΩ			
Input ranges (rated values), currents				
• 4 mA to 20 mA			Yes	Yes; Min. 295 Ohm
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			

I/O systems

ET 200 systems for the control cabinet

ET 200iSP

Analog electronic modules

Technical specifications (continued)

Article number	6ES7134-7SD00-0AB0 ET200iSP, EL-MOD., 4 AI TC	6ES7134-7SD51-0AB0 ET200iSP, EL-MOD., 4 AI RTD, PT100/NI100	6ES7134-7TD00-0AB0 ET200iSP, EL-MOD., 4 AI, HART, 2-WIRE	6ES7134-7TD50-0AB0 ET200iSP, EL-MOD., 4 AI, HART, 4-WIRE
<ul style="list-style-type: none"> Type J Input resistance (type J) Type K Input resistance (Type K) Type L Input resistance (Type L) Type N Input resistance (Type N) Type R Input resistance (Type R) Type S Input resistance (Type S) Type T Input resistance (Type T) Type U Input resistance (Type U) 	Yes 1 000 kΩ Yes 1 000 kΩ Yes 1 000 kΩ Yes 1 000 kΩ Yes 1 000 kΩ Yes 1 000 kΩ Yes 1 000 kΩ Yes 1 000 kΩ			
Input ranges (rated values), resistance thermometer <ul style="list-style-type: none"> Ni 100 Input resistance (Ni 100) Pt 100 Input resistance (Pt 100) 		Yes 2 000 kΩ Yes 2 000 kΩ		
Input ranges (rated values), resistors <ul style="list-style-type: none"> 0 to 600 ohms Input resistance (0 to 600 ohms) 		Yes; Also 1000 ohms 1 000 kΩ		
Thermocouple (TC) Temperature compensation <ul style="list-style-type: none"> internal temperature compensation external temperature compensation with compensations socket 	Yes; via supplied TC sensor module Yes; via temperature value, acquired by an analog module of the same ET 200iSP station			
Characteristic linearization <ul style="list-style-type: none"> Parameterizable for thermocouples for resistance thermometer 	Yes 1	Yes Yes		
Cable length <ul style="list-style-type: none"> shielded, max. 	50 m	500 m	500 m	500 m
Analog value generation for the inputs				
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)
Integration and conversion time/ resolution per channel <ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. Integration time, parameterizable Basic conversion time, including integration time (ms) <ul style="list-style-type: none"> additional conversion time for wire break monitoring Interference voltage suppression for interference frequency f1 in Hz 	16 bit Yes 80 ms at 50 Hz; 66 ms at 60 Hz 5 ms 50 / 60 Hz	16 bit Yes 80 ms at 50 Hz; 66 ms at 60 Hz 5 ms 50 / 60 Hz	13 bit No 50 / 60 Hz	12 bit; + sign Yes 30 ms 50 / 60 Hz
Smoothing of measured values <ul style="list-style-type: none"> Parameterizable Step: None Step: low Step: Medium Step: High 	Yes; in 4 stages Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; in 4 stages Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; in 4 stages Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; in 4 stages Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time

Technical specifications (continued)

Article number	6ES7134-7SD00-0AB0 ET200iSP, EL-MOD., 4 AI TC	6ES7134-7SD51-0AB0 ET200iSP, EL-MOD., 4 AI RTD, PT100/NI100	6ES7134-7TD00-0AB0 ET200iSP, EL-MOD., 4 AI, HART, 2-WIRE	6ES7134-7TD50-0AB0 ET200iSP, EL-MOD., 4 AI, HART, 4-WIRE
Encoder				
Connection of signal encoders				
<ul style="list-style-type: none"> for current measurement as 2-wire transducer - Burden of 2-wire transmitter, max. for current measurement as 4-wire transducer for resistance measurement with two-wire connection for resistance measurement with three-wire connection for resistance measurement with four-wire connection 		Yes	750 ?	Yes
Errors/accuracies				
Linearity error (relative to input range), (+/-)	0.015 %	0.015 %	0.015 %	0.015 %
Temperature error (relative to input range), (+/-)	0.02 %/K	0.02 %/K	0.005 %/K	0.005 %/K
Crosstalk between the inputs, min.	-50 dB	-50 dB	-50 dB	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.01 %	0.01 %	0.01 %	0.01 %
Operational limit in overall temperature range				
<ul style="list-style-type: none"> Voltage, relative to input area, (+/-) Current, relative to input area, (+/-) Resistance thermometer, relative to input area, (+/-) 	0.15 %	0.15 %; Applies to resistances standard ± 0.8 K, climatic ± 0.3 K	0.15 %	0.15 %
Basic error limit (operational limit at 25 °C)				
<ul style="list-style-type: none"> Voltage, relative to input area, (+/-) Current, relative to input area, (+/-) Resistance thermometer, relative to input area, (+/-) 	0.1 %	0.1 %; Applies to resistances standard ± 0.5 K, climatic ± 0.2 K	0.1 %	0.1 %
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, $f_1 =$ interference frequency				
<ul style="list-style-type: none"> Series mode interference (peak value of interference < rated value of input range), min. Common mode interference, min. 	70 dB 90 dB	70 dB 90 dB	70 dB	70 dB
Interrupts/diagnostics/status information				
Alarms				
<ul style="list-style-type: none"> Diagnostic alarm Limit value alarm 	Yes; Parameterizable Yes; Parameterizable	Yes Yes	Yes; Parameterizable Yes; Parameterizable	Yes; Parameterizable Yes; Parameterizable
Diagnostic messages				
<ul style="list-style-type: none"> Diagnostic information readable Wire break Short circuit Group error 	Yes	Yes Yes Yes Yes	Yes Yes Yes	Yes Yes
Diagnostics indication LED				
<ul style="list-style-type: none"> Group error SF (red) 	Yes	Yes	Yes	Yes

I/O systems

ET 200 systems for the control cabinet

ET 200iSP

Analog electronic modules**Technical specifications (continued)**

Article number	6ES7134-7SD00-0AB0 ET200iSP, EL-MOD., 4 AI TC	6ES7134-7SD51-0AB0 ET200iSP, EL-MOD., 4 AI RTD, PT100/NI100	6ES7134-7TD00-0AB0 ET200iSP, EL-MOD., 4 AI, HART, 2-WIRE	6ES7134-7TD50-0AB0 ET200iSP, EL-MOD., 4 AI, HART, 4-WIRE
Galvanic isolation				
Galvanic isolation analog inputs				
• between the channels	Yes; Functional, yes	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
• between the channels and the load voltage L+		Yes; Channels and power bus		
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
Highest safety class achievable in safety mode				
• Performance level according to EN ISO 13849-1:2008	none	none	none	none
• SIL according to IEC 61508	No	No	No	No
Use in hazardous areas				
• 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	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	04 ATEX 1246	04 ATEX 1247	04 ATEX 1244	04 ATEX 1245
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
Weights				
Weight, approx.	230 g	230 g	230 g	230 g

Technical specifications (continued)

Article number	6ES7135-7TD00-0AB0 ET200iSP, EL-MOD., 4 AO, 4-20mA, HART
Product type designation	
Input current	
from load voltage 1L+, max.	330 mA
Power losses	
Power loss, max.	2.7 W
Analog outputs	
Number of analog outputs	4
Cycle time (all channels) max.	3.6 ms
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with current outputs, max.	750 Ω
Cable length	
• shielded, max.	500 m
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	14 bit
Settling time	
• for resistive load	4 ms
• for capacitive load	40 ms
• for inductive load	40 ms
Errors/accuracies	
Linearity error (relative to output range), (+/-)	0.015 %
Temperature error (relative to output range), (+/-)	0.005 %/K
Crosstalk between the outputs, min.	-50 dB
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.01 %
Operational limit in overall temperature range	
• Current, relative to output area, (+/-)	0.15 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to output area, (+/-)	0.1 %

Article number	6ES7135-7TD00-0AB0 ET200iSP, EL-MOD., 4 AO, 4-20mA, HART
Interrupts/diagnostics/status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
• Wire break	Yes
• Short circuit	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
Galvanic isolation	
Galvanic isolation analog outputs	
• between the channels	No
• between the channels and the backplane bus	Yes
Standards, approvals, certificates	
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1250
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	265 g

I/O systems

ET 200 systems for the control cabinet
ET 200iSP

Analog electronic modules**Technical specifications (continued)**

Article number	6ES7193-7CA00-0AA0 ET200iSP, TERM.-MOD. TM-EM/ EM60S F. EM	6ES7193-7CA10-0AA0 ET200iSP, TERM.-MOD. TM-EM/ EM60C F. EM	6ES7193-7CB00-0AA0 ET200iSP, TERM.-MOD. TM-RM/RM
Product type designation			
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
Use in hazardous areas			
• Type of protection acc. to EN 50020 (CENELEC)	see ET200iSP system	see ET200iSP system	see ET200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	07 ATEX 0205
Dimensions			
Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm
Weights			
Weight, approx.	275 g	275 g	340 g

Ordering data**Article No.****Article No.****Analog input modules****4 AI | 2WIRE HART** **6ES7134-7TD00-0AB0****4 AI | 4WIRE HART** **6ES7134-7TD50-0AB0****4 AI RTD** **6ES7134-7SD51-0AB0****4 AI TC** **6ES7134-7SD00-0AB0****Analog output modules****4 AO | HART** **6ES7135-7TD00-0AB0****Terminal modules****TM-EM/EM60S** **6ES7193-7CA00-0AA0**Terminal module E60S
(screw-type terminal)**TM-EM/EM60C** **6ES7193-7CA10-0AA0**Terminal module E60C
(spring-loaded terminal)**Accessories****Connector**PROFIBUS connector with active
terminating resistor**6ES7972-0DA60-0XA0**

For RS 485-IS circuit; 1.5 Mbit/s

RS 485-IS coupler**6ES7972-0AC80-0XA0**Isolating transformer
for coupling of PROFIBUS DP
and PROFIBUS RS 485-IS**Labeling sheets**DIN A4, perforated, each consisting
of 10 sheets of 30 strips each,
used for electronic modules
and 20 strips, used for IM 151

- petrol
- yellow

6ES7193-7BH00-0AA0
6ES7193-7BB00-0AA0**Labels, inscribed**Ordering unit 1 set with 200 pieces
each for slot numbering

- 10 x slots 1 to 2
- 5 x slots 1 to 40

8WA8861-0AB
8WA8861-0AC**Labels, blank****8WA8848-2AY**Ordering unit 1 set with 200 pieces
each for slot numbering**S7-300 DIN rails**

Standard rail 585 mm

6ES7390-1AF85-0AA0

Standard rail 885 mm

6ES7390-1AJ85-0AA0

Ordering data	Article No.	Article No.
<p>Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e</p> <p>Empty enclosure without installation of modules, for use in gaseous area, IP65 (IP54 when using a breather gland)</p> <ul style="list-style-type: none"> • 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) <p>Empty enclosure without installation of modules, for use in dust area, IP65</p> <ul style="list-style-type: none"> • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust 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 dust 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 dust 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 dust area, with 5 rows of M16 cable entries (111 units) 	<p>6DL2804-0AD30</p> <p>6DL2804-0AD50</p> <p>6DL2804-0AE30</p> <p>6DL2804-0AE50</p> <p>6DL2804-0DD30</p> <p>6DL2804-0DD50</p> <p>6DL2804-0DE30</p> <p>6DL2804-0DE50</p>	<p>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</p> <ul style="list-style-type: none"> • 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) <p>Enclosure with installation of modules, for use in dust area, IP65; the ET 200iSP components must be ordered separately</p> <ul style="list-style-type: none"> • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust 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 dust 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 dust 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 dust area, with 5 rows of M16 cable entries (111 units)
		<p>6DL2804-1AD30</p> <p>6DL2804-1AD50</p> <p>6DL2804-1AE30</p> <p>6DL2804-1AE50</p> <p>6DL2804-1DD30</p> <p>6DL2804-1DD50</p> <p>6DL2804-1DE30</p> <p>6DL2804-1DE50</p>

I/O systems

ET 200 systems for the control cabinet
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 (SIL3/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

Article number	6ES7138-7FN00-0AB0 ET200iSP, 8F-DI NAMUR EX, FAILSAFE
Product type designation	
FH technology	
Module for failsafe applications	Yes
Input current	
from supply voltage L+, max.	150 mA; int. Powerbus
Encoder supply	
Number of outputs	8
Type of output voltage	8 V DC
Power losses	
Power loss, typ.	1.4 W
Address area	
Occupied address area	
• Inputs	6 byte
• Outputs	4 byte
Digital inputs	
Number of digital inputs	8
Number of NAMUR inputs	8
Input voltage	
• Type of input voltage	DC
Input current	
• 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	
• shielded, max.	500 m
• Unshielded, max.	200 m

Article number	6ES7138-7FN00-0AB0 ET200iSP, 8F-DI NAMUR EX, FAILSAFE
Encoder	
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
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	No
Diagnostic messages	
• 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 ohms with NAMUR sensor/sensor and NAMUR changeover contact/sensor to DIN 19234
Diagnostics indication LED	
• Group error SF (red)	Yes

Technical specifications (continued)

Article number	6ES7138-7FN00-0AB0 ET200iSP, 8F-DI NAMUR EX, FAILSAFE
Parameter	
Diagnosis: wire break	channel by channel
Diagnosis: short circuit	channel by channel
Galvanic isolation	
between the channels and backplane bus	Yes
Galvanic isolation digital inputs	
• between the channels	No
• between the channels and the backplane bus	Yes
Permissible potential difference	
between different circuits	60V DC/30V AC
Isolation	
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

Article number	6ES7138-7FN00-0AB0 ET200iSP, 8F-DI NAMUR EX, FAILSAFE
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• Performance level according to EN ISO 13849-1:2008	PLe
• SIL according to IEC 61508	SIL 3
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia Ga][ia IIC Da]
• Type of protection acc. to KEMA	IIC T4 GB and I M2 Ex ib[ia Ma] I Mb 10 ATEX 0056
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	288 g

Ordering data

Article No.

Article No.

F digital input modules	
8 F-DI Ex NAMUR	6ES7138-7FN00-0AB0
Terminal modules	
TM-EM/EM60S	6ES7193-7CA00-0AA0
Terminal module E60S (screw-type terminal)	
TM-EM/EM60C	6ES7193-7CA10-0AA0
Terminal module E60C (spring-loaded terminal)	
Accessories	
Cable connector	
PROFIBUS cable connector with active terminating resistor	6ES7972-0DA60-0XA0
For RS 485-IS electric circuit; 1.5 Mbit/s	
RS 485-IS coupler	6ES7972-0AC80-0XA0
Isolating transformer for connection of PROFIBUS DP and PROFIBUS RS 485-IS	
Labeling sheets	
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	6ES7193-7BH00-0AA0
• yellow	6ES7193-7BB00-0AA0
Labels, inscribed	
Ordering unit: 1 set with 200 items each for slot numbering	
• 10 x slots 1 to 2	8WA8861-0AB
• 5 x slots 1 to 40	8WA8861-0AC
Labels, not inscribed	8WA8848-2AY
Ordering unit: 1 set with 200 items each for slot numbering	

Distributed Safety V5.4 programming tool	
Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S Requirement: STEP 7 V5.3 SP3 and higher	
Floating License	6ES7833-1FC02-0YA5
S7 F Systems RT License	6ES7833-1CC00-6YX0
For processing safety-related user programs, for one AS 412F/FH, AS 414F/FH or AS 417F/FH	
S7 F Systems V6.1	6ES7833-1CC02-0YA5
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 2 languages (German, English) Delivery form: Certificate of License as well as software and electronic documentation on CD	

I/O systems

ET 200 systems for the control cabinet
 ET 200iSP – Fail-safe electronic modules

F digital input module

Ordering data	Article No.	Article No.	Article No.
<p>SIMATIC Safety Matrix Tool V6.2 Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment 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 1 language (English), executes with Windows XP Professional <i>Type of delivery:</i> Certificate of License and authorization diskette for Safety Matrix Tool and Safety Matrix Viewer; software and electronic documentation on CD Floating License for 1 installation Floating License upgrade from V5.x/V6.x to V6.2</p>	<p>6ES7833-1SM02-0YA5 6ES7833-1SM02-0YE5</p>	<p>SIMATIC Safety Matrix Editor V6.2 Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment 1 language (English), executes with Windows 2000 Professional or Windows XP Professional, single license for 1 installation <i>Type of delivery:</i> Certificate of License and authorization diskette; software and electronic documentation on CD</p>	<p>6ES7833-1SM42-0YA5</p>
		<p>SIMATIC Safety Matrix Viewer V6.2 for SIMATIC PCS 7 Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several operator control levels 2 languages (English/German), runs under Windows 2000 Professional, Windows XP Professional, Windows 2003 Server <i>Type of delivery:</i> Certificate of License and authorization diskette; software and electronic documentation on CD Floating License for 1 installation Floating License upgrade from V6.x to V6.2</p>	<p>6ES7833-1SM62-0YA5 6ES7833-1SM62-0YE5</p>

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

Article number	6ES7138-7FD00-0AB0 ET200iSP, 4F-DO 40MA EX, FAILSAFE
Product type designation	
Input current	
from load voltage L+ (without load), max.	510 mA; int. Powerbus
Power losses	
Power loss, typ.	5.3 W; max.
Digital outputs	
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 _{ao} (DC)	17.4 V
Internal resistor R _i	167 Ω
Load resistance range	
• lower limit	270 Ω
• upper limit	18 kΩ
Trend key points E	
• Voltage U _e (DC)	10 V
• Current I _e	40 mA
Output voltage	
• for signal "1", min.	max. 17.4 V
Output current	
• for signal "0" residual current, max.	10 μA

Article number	6ES7138-7FD00-0AB0 ET200iSP, 4F-DO 40MA EX, FAILSAFE
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
Cable length	
• shielded, max.	500 m
• Unshielded, max.	500 m
Interrupts/diagnostics/ status information	
Status indicator	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Diagnostic information readable	Yes
• Wire break	Yes
• Short circuit	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes

I/O systems

ET 200 systems for the control cabinet
ET 200iSP – Fail-safe electronic modules

F digital output module

Technical specifications (continued)

Article number	6ES7138-7FD00-0AB0 ET200iSP, 4F-DO 40MA EX, FAILSAFE
Parameter	
Diagnosis: wire break	Yes
Diagnosis: short circuit	Yes
Galvanic isolation	
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
Permissible potential difference	
between different circuits	60V DC/30V AC
Isolation	
Isolation checked with	370V for 1 min

Article number	6ES7138-7FD00-0AB0 ET200iSP, 4F-DO 40MA EX, FAILSAFE
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• Performance level according to EN ISO 13849-1:2008	PLe
• SIL according to IEC 61508	SIL 3
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia Ga][ia IIC Da]
• Type of protection acc. to KEMA	IIC T4 GB and I M2 Ex ib[ia Ma] I Mb 10 ATEX 0057
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	285 g

Ordering data

Article No.

Digital output module	
4 F-DO Ex 17.4 V/40 mA	6ES7138-7FD00-0AB0
Terminal modules	
TM-EM/EM60S	6ES7193-7CA00-0AA0
Terminal module E60S (screw-type terminal)	
TM-EM/EM60C	6ES7193-7CA10-0AA0
Terminal module E60C (spring-loaded terminal)	
Accessories	
Cable connector	
PROFIBUS cable connector with active terminating resistor	6ES7972-0DA60-0XA0
For RS 485-IS electric circuit; 1.5 Mbit/s	
RS 485-IS coupler	6ES7972-0AC80-0XA0
Isolating transformer for connection of PROFIBUS DP and PROFIBUS RS 485-IS	
Labeling sheets	
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	6ES7193-7BH00-0AA0
• yellow	6ES7193-7BB00-0AA0
Labels, inscribed	
Ordering unit: 1 set with 200 items each for slot numbering	
• 10 x slots 1 to 2	8WA8861-0AB
• 5 x slots 1 to 40	8WA8861-0AC

Article No.

Labels, not inscribed	8WA8848-2AY
Ordering unit: 1 set with 200 items each for slot numbering	
Distributed Safety V5.4 programming tool	
Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S	
Requirement: STEP 7 V5.3 SP3 and higher	
Floating License	6ES7833-1FC02-0YA5
S7 F Systems RT License	6ES7833-1CC00-6YX0
For processing safety-related user programs, for one AS 412F/FH, AS 414F/FH or AS 417F/FH	
S7 F Systems V6.1	6ES7833-1CC02-0YA5
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	
2 languages (German, English)	
Delivery form: Certificate of License as well as software and electronic documentation on CD	

Ordering data	Article No.	Article No.	Article No.
<p>SIMATIC Safety Matrix Tool V6.2 Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment 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 1 language (English), executes with Windows XP Professional <i>Delivery form:</i> Certificate of License and authorization diskette for Safety Matrix Tool and Safety Matrix Viewer; software and electronic documentation on CD Floating License for 1 installation Floating License upgrade from V5.x/V6.x to V6.2</p>	<p>6ES7833-1SM02-0YA5 6ES7833-1SM02-0YE5</p>	<p>SIMATIC Safety Matrix Editor V6.2 Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment 1 language (English), executes with Windows 2000 Professional or Windows XP Professional, single license for 1 installation <i>Delivery form:</i> Certificate of License and authorization diskette; software and electronic documentation on CD</p>	<p>6ES7833-1SM42-0YA5</p>
		<p>SIMATIC Safety Matrix Viewer V6.2 for SIMATIC PCS 7 Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several operator control levels 2 languages (English/German), runs under Windows 2000 Professional, Windows XP Professional, Windows 2003 Server <i>Delivery form:</i> Certificate of License and authorization diskette; software and electronic documentation on CD Floating License for 1 installation Floating License upgrade from V6.x to V6.2</p>	<p>6ES7833-1SM62-0YA5 6ES7833-1SM62-0YE5</p>

I/O systems

ET 200 systems for the control cabinet
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 (SIL3/Cat.3/PLe) or 4 inputs 2-channel (SIL3/Cat.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

Article number	6ES7138-7FA00-0AB0 ET200iSP, 4F-AI HART EX, FAILSAFE
Product type designation	
Input current	
from supply voltage L+, max.	490 mA; int. Powerbus
Output voltage	
Power supply to the transmitters	
• short-circuit proof	Yes
• Supply current, max.	25 mA; Plus 4 mA per channel
Power losses	
Power loss, typ.	5.4 W; max.
Address area	
Address space per module	
• Address space per module, max.	16 byte; 12 bytes in the I area / 4 bytes in the O area
Analog inputs	
Number of analog inputs	4
Cycle time (all channels) max.	See data in manual
Input ranges	
• Voltage	No
• Current	Yes
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), currents	
• 4 mA to 20 mA	Yes; and 0 to 20 mA
Cable length	
• shielded, max.	500 m

Article number	6ES7138-7FA00-0AB0 ET200iSP, 4F-AI HART EX, FAILSAFE
Analog value generation for the inputs	
Measurement principle	integrating (Sigma-Delta)
Integration 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
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	750 Ω

Technical specifications (continued)

Article number	6ES7138-7FA00-0AB0 ET200iSP, 4F-AI HART EX, FAILSAFE	Article number	6ES7138-7FA00-0AB0 ET200iSP, 4F-AI HART EX, FAILSAFE
Errors/accuracies		Galvanic isolation	
Linearity error (relative to input range), (+/-)	0.015 %	Galvanic isolation analog inputs	
Temperature error (relative to input range), (+/-)	0.005 %/K	• between the channels	No
Crosstalk between the inputs, min.	-50 dB	• between the channels and the backplane bus	Yes
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.015 %	• between the channels and the load voltage L+	Yes; Power bus
Operational limit in overall temperature range		Permissible potential difference	
• Current, relative to input area, (+/-)	0.35 %	between the inputs (UCM)	60V DC/30V AC
Basic error limit (operational limit at 25 °C)		Standards, approvals, certificates	
• Current, relative to input area, (+/-)	0.1 %	CE mark	Yes
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$, $f1 =$ interference frequency		Highest safety class achievable in safety mode	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	• Performance level according to EN ISO 13849-1:2008	PLe
• Common mode interference, min.	50 dB	• SIL according to IEC 61508	SIL 3
Interrupts/diagnostics/status information		Use in hazardous areas	
Alarms		• 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
• Diagnostic alarm	Yes; Parameterizable	• Type of protection acc. to KEMA	10 ATEX 0058
Diagnostic messages		Dimensions	
• Diagnostic information readable	Yes	Width	30 mm
• Wire break	Yes	Height	129 mm
• Short circuit	Yes	Depth	136.5 mm
Diagnostics indication LED		Weights	
• Group error SF (red)	Yes	Weight, approx.	299 g

I/O systems

ET 200 systems for the control cabinet
ET 200iSP – Fail-safe electronic modules

F analog input module

Ordering data

F analog input module

4 F-AI Ex HART

6ES7138-7FA00-0AB0

Terminal modules

TM-EM/EM60S

Terminal module E60S
(screw-type terminal)

6ES7193-7CA00-0AAA

TM-EM/EM60C

Terminal module E60C
(spring-loaded terminal)

6ES7193-7CA10-0AAA

Accessories

Cable connector

PROFIBUS cable connector
with active terminating resistor

For RS 485-IS electric circuit;
1.5 Mbit/s

6ES7972-0DA60-0XA0

RS 485-IS coupler

Isolating transformer for
connection of PROFIBUS DP
and PROFIBUS RS 485-IS

6ES7972-0AC80-0XA0

Labeling sheets

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
- yellow

6ES7193-7BH00-0AAA
6ES7193-7BB00-0AAA

Labels, inscribed

Ordering unit: 1 set with 200 items
each for slot numbering

- 10 x slots 1 to 2
- 5 x slots 1 to 40

8WA8861-0AB
8WA8861-0AC

Labels, not inscribed

8WA8848-2AY

Ordering unit: 1 set with 200 items
each for slot numbering

Distributed Safety V5.4 programming tool

Task: Software for configuring of
fail-safe user programs for
SIMATIC S7-300F, S7-400F,
ET 200S

Requirement: STEP 7 V5.3 SP3 and
higher

Floating License

6ES7833-1FC02-0YA5

S7 F Systems RT License

6ES7833-1CC00-6YX0

For processing safety-related user
programs, for one AS 412F/FH,
AS 414F/FH or AS 417F/FH

S7 F Systems V6.1

Programming and configuring envi-
ronment for creating and operating
safety-related STEP 7 programs for
an S7 400H-based target system,
Floating License for 1 user, execut-
able under Windows XP Prof SP2/
SP3, Windows Server 2003 SP2

2 languages (German, English)

Delivery form:

Certificate of License as well as
software and electronic documenta-
tion on CD

6ES7833-1CC02-0YA5

SIMATIC Safety Matrix Tool V6.2

Creation, configuration, compila-
tion, loading and online monitoring
of the Safety Matrix in a
SIMATIC PCS 7 environment

Including SIMATIC Safety Matrix
Viewer for SIMATIC PCS 7, for oper-
ation and monitoring of the Safety
Matrix in a SIMATIC PCS 7 environ-
ment with several operator control
levels

1 language (English), executes
with Windows XP Professional

Delivery form: Certificate of License
and authorization diskette for Safety
Matrix Tool and Safety Matrix
Viewer; software and electronic
documentation on CD

Floating License for 1 installation

6ES7833-1SM02-0YA5

Floating License upgrade from
V5.x/V6.x to V6.2

6ES7833-1SM02-0YE5

SIMATIC Safety Matrix Editor V6.2

Creation and checking of the Safety
Matrix logic on an external com-
puter without a SIMATIC PCS 7 or
STEP 7 environment

1 language (English), executes
with Windows 2000 Professional or
Windows XP Professional,

single license for 1 installation
Delivery form: Certificate of License
and authorization diskette; software
and electronic documentation on
CD

6ES7833-1SM42-0YA5

SIMATIC Safety Matrix Viewer V6.2 for SIMATIC PCS 7

Operation and monitoring of the
Safety Matrix in the SIMATIC PCS 7
environment with several operator
control levels

2 languages (English/German),
runs under Windows 2000 Profes-
sional, Windows XP Professional,
Windows 2003 Server

Delivery form: Certificate of License
and authorization diskette; software
and electronic documentation on
CD

Floating License for 1 installation
Floating License upgrade from V6.x
to V6.2

6ES7833-1SM62-0YA5
6ES7833-1SM62-0YE5

Overview



- The watchdog module is plugged onto the associated terminal module with screw or spring-loaded connection (to be ordered separately).
- Modules can be replaced under potentially explosive conditions during runtime.

Technical specifications

Article number	6ES7138-7BB00-0AB0 ET 200iSP, WATCHDOG MOD.
Product type designation	
Supply voltage	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Digital inputs	
Number of digital inputs	0
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm

Ordering data

	Article No.
Watchdog module	6ES7138-7BB00-0AB0
Terminal modules	
TM-EM/EM60S	6ES7193-7CA00-0AA0
Terminal module E60S (screw-type terminal)	
TM-EM/EM60C	6ES7193-7CA10-0AA0
Terminal module E60C (spring-loaded terminal)	
Accessories	
Connectors	
PROFIBUS connector with active terminating resistor	6ES7972-0DA60-0XA0
For RS485-IS circuit; 1.5 Mbit/s	
RS 485-IS coupler	6ES7972-0AC80-0XA0
Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS	

Labeling sheets

DIN A4, perforated, each consisting of 10 sheets of 30 strips each, used for electronic modules and 20 strips, used for IM 151

- petrol
- yellow

Article No.

6ES7193-7BH00-0AA0
6ES7193-7BB00-0AA0

I/O systems

ET 200 systems for the control cabinet

ET 200iSP

ET 200iSP watchdog module

Ordering data

Labels, inscribed

Ordering unit 1 set with 200 pieces each for slot numbering

- 10 x slots 1 to 2
- 5 x slots 1 to 40

8WA8861-0AB
8WA8861-0AC

Labels, blank

Ordering unit 1 set with 200 pieces each for slot numbering

8WA8848-2AY

S7-300 DIN rails

Standard Rail 585 mm

6ES7390-1AF85-0AA0

Standard Rail 885 mm

6ES7390-1AJ85-0AA0

Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e

Empty enclosure without installation of modules, for use in 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 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)

6DL2804-0AD30

6DL2804-0AD50

6DL2804-0AE30

6DL2804-0AE50

Empty enclosure without installation of modules, for use in dust area, IP65

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust 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 dust 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 dust 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 dust area, with 5 rows of M16 cable entries (111 units)

6DL2804-0DD30

6DL2804-0DD50

6DL2804-0DE30

6DL2804-0DE50

Article No.

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)

6DL2804-1AD30

6DL2804-1AD50

6DL2804-1AE30

6DL2804-1AE50

Enclosure with installation of modules, for use in dust 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 dust 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 dust 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 dust 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 dust area, with 5 rows of M16 cable entries (111 units)

6DL2804-1DD30

6DL2804-1DD50

6DL2804-1DE30

6DL2804-1DE50

Overview



- The reserve 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

Article number	6ES7138-7AA00-0AA0 ET200iSP, RESERVE MODULE
Product type designation	
Installation type/mounting	
Wall mounting/direct mounting possible	Yes
Digital inputs	
Number of digital inputs	0
Standards, approvals, certificates	
CE mark	Yes
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G EEx ib IIC T4
• Test number KEMA	04 ATEX 1251
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	180 g

Article number	6ES7193-7CA00-0AA0 ET200iSP, TERM.-MOD. TM-EM/EM60S F. EM	6ES7193-7CA10-0AA0 ET200iSP, TERM.-MOD. TM-EM/EM60C F. EM	6ES7193-7CB00-0AA0 ET200iSP, TERM.-MOD. TM-RM/RM
Product type designation			
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
Use in hazardous areas			
• Type of protection acc. to EN 50020 (CENELEC)	see ET200iSP system	see ET200iSP system	see ET200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	07 ATEX 0205
Dimensions			
Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm
Weights			
Weight, approx.	275 g	275 g	340 g

I/O systems

ET 200 systems for the control cabinet

ET 200iSP

Reserve module**Ordering data****Article No.**

Reserve module	6ES7138-7AA00-0AA0
Terminal modules	
TM-EM/EM 60S	6ES7193-7CA00-0AA0
Terminal module E60S (screw-type terminal)	
TM-EM/EM 60C	6ES7193-7CA10-0AA0
Terminal module E60C (spring-loaded terminal)	
TM-RM/RM 60S	6ES7193-7CB00-0AA0
For accommodating digital output module 2 DO relay and reserve modules; screw-type terminal	
Accessories	
Connectors	
PROFIBUS connector with active terminating resistor	6ES7972-0DA60-0XA0
For RS 485-IS circuit; 1.5 Mbit/s	
RS 485-IS coupler	6ES7972-0AC80-0XA0
Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS	
Labeling sheets	
DIN A4, perforated, each consisting of 10 sheets of 30 strips each, used for electronic modules and 20 strips, used for IM 151	
• petrol	6ES7193-7BH00-0AA0
• yellow	6ES7193-7BB00-0AA0
Labels, inscribed	
Ordering unit 1 set with 200 pieces each for slot numbering	
• 10 x slots 1 to 2	8WA8861-0AB
• 5 x slots 1 to 40	8WA8861-0AC
Labels, blank	8WA8848-2AY
Ordering unit 1 set with 200 pieces each for slot numbering	
S7-300 DIN rails	
Standard rail 585 mm	6ES7390-1AF85-0AA0
Standard rail 885 mm	6ES7390-1AJ85-0AA0

Article No.**Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e**

Empty enclosure without installation of modules, for use in 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 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)

Empty enclosure without installation of modules, for use in dust area, IP65

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust 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 dust 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 dust 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 dust area, with 5 rows of M16 cable entries (111 units)

6DL2804-0AD30**6DL2804-0AD50****6DL2804-0AE30****6DL2804-0AE50****6DL2804-0DD30****6DL2804-0DD50****6DL2804-0DE30****6DL2804-0DE50**

Ordering data	Article No.		Article No.
<p>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</p> <ul style="list-style-type: none"> • 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) 	<p>6DL2804-1AD30</p> <p>6DL2804-1AD50</p> <p>6DL2804-1AE30</p> <p>6DL2804-1AE50</p>	<p>Enclosure with installation of modules, for use in dust area, IP65; the ET 200iSP components must be ordered separately</p> <ul style="list-style-type: none"> • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust 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 dust 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 dust 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 dust area, with 5 rows of M16 cable entries (111 units) 	<p>6DL2804-1DD30</p> <p>6DL2804-1DD50</p> <p>6DL2804-1DE30</p> <p>6DL2804-1DE50</p>

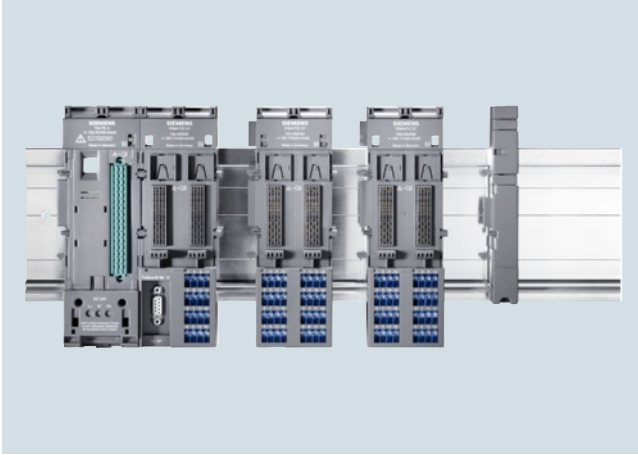
I/O systems

ET 200 systems for the control cabinet

ET 200iSP

Terminal modules

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

6ES7193-7DA10-0AA0

TM-PS A UC
for accommodating a 110/230 V AC
power supply

6ES7193-7DA20-0AA0

TM-PS B
for accommodating an additional,
redundant 24 V DC power supply

6ES7193-7DB10-0AA0

TM-PS B UC
for accommodating an additional,
redundant 110/230 V AC power
supply

6ES7193-7DB20-0AA0

TM-IM/xx terminal modules

TM-IM/EM60S
for accommodating the IM152-1
and an electronic module,
including power termination
module; screw terminals

6ES7193-7AA00-0AA0

TM-IM/EM60S
for accommodating the IM152-1
and an electronic module,
including power termination
module; screw terminals, black

6ES7193-7AA20-0AA0

TM-IM/EM60C
for accommodating the IM152-1
and an electronic module,
including power termination
module; spring-loaded terminals

6ES7193-7AA10-0AA0

TM-IM/IM
for accommodating two IM152-1
modules in redundant mode,
including power termination module

6ES7193-7AB00-0AA0

Article No.

TM-EM/EM terminal modules

TM-EM/EM60S
for accommodating two electronic
modules, screw terminals

6ES7193-7CA00-0AA0

TM-EM/EM60S
for accommodating two electronic
modules, screw terminals, black

6ES7193-7CA20-0AA0

TM-EM/EM60C
for accommodating two electronic
modules, spring-loaded terminals

6ES7193-7CA10-0AA0

TM-RM/RM terminal module

TM-RM/RM
for accommodating two relay
modules, screw terminals

6ES7193-7CB00-0AA0

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"> • PROFIBUS • EU directive • CENELEC • UL and CSA 	IEC 61784-1: 2002 Ed1 CP 3/1 94/9/EG (ATEX 100a) II 3 (2) G EEx nA[ib] IIC T4 Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Division 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC
<ul style="list-style-type: none"> • FM 	Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Division 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC
<ul style="list-style-type: none"> • IEC • CE 	IEC61131-2, Part 2 Conforming with 89/336/EWG Conforming with 73/23/EWG
<ul style="list-style-type: none"> • Ship-building certification 	Classification companies <ul style="list-style-type: none"> • ABS (American Bureau of Shipping) • BV (Bureau Veritas) • DNV (Det Norske Veritas) • GL (Germanischer Lloyd) • LRD (Lloyds Register of Shipping) • Class NK (Nippon Kaiji Kyokai)
Module-specific specifications	
Data transmission rate on PROFIBUS DP, PROFIBUS RS 485-IS	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbit/s 1.5 Mbit/s
Bus protocol	PROFIBUS DP

Technical specifications RS 485-IS Coupler													
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"> • Polarity reversal protection • Voltage drop bypass 	Yes Min. 5 ms												
Potential isolation for 24 V power supply													
<ul style="list-style-type: none"> • to PROFIBUS DP - tested with • to PROFIBUS RS 485-IS - tested with 	Yes 500 V DC Yes 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													
<ul style="list-style-type: none"> • Bus monitoring PROFIBUS DP (primary) • Bus monitoring PROFIBUS RS 485-IS (secondary) • Monitoring 24 V power supply 	Yellow LED "DP1" Yellow LED "DP2" Green LED "ON"												
Technical safety notice													
V_{DC}	± 4.2 V												
I_{SC}	± 93 mA												
P_0	0.1 Watts												
V_{max}	± 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	<table border="1"> <thead> <tr> <th></th> <th>RS 485-IS</th> <th>DP Ex i</th> </tr> </thead> <tbody> <tr> <td>• 9.6 ... 187.5 kbit/s</td> <td>1,000 m</td> <td>200 m</td> </tr> <tr> <td>• 500 kbit/s</td> <td>400 m</td> <td>200 m</td> </tr> <tr> <td>• 1.5 Mbit/s</td> <td>200 m</td> <td>200 m</td> </tr> </tbody> </table>		RS 485-IS	DP Ex i	• 9.6 ... 187.5 kbit/s	1,000 m	200 m	• 500 kbit/s	400 m	200 m	• 1.5 Mbit/s	200 m	200 m
	RS 485-IS	DP Ex i											
• 9.6 ... 187.5 kbit/s	1,000 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	integrated, can be added switch												

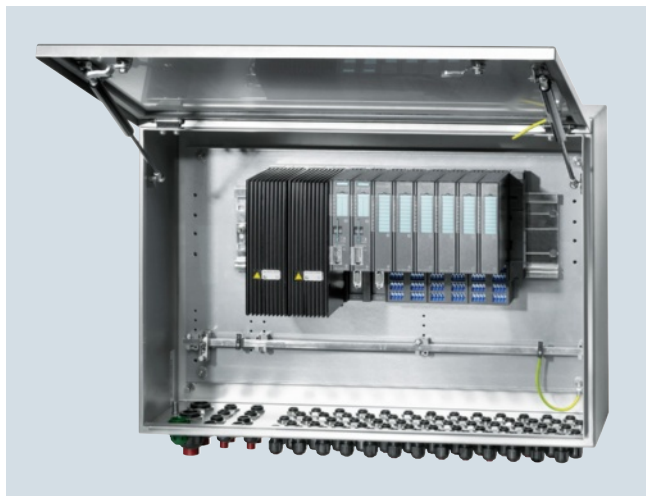
I/O systems

ET 200 systems for the control cabinet
ET 200iSP

RS 485-IS coupler

Ordering data	Article No.		Article No.
<p>RS 485-IS coupler</p> <p>Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS</p>	<p>6ES7972-0AC80-0XA0</p>	<p>Accessories</p> <p>PROFIBUS connector with active terminating resistor For RS 485-IS circuit; 1.5 Mbit/s</p> <p>PROFIBUS cable connector For the intrinsically safe PROFIBUS, 1.5 Mbit/s</p> <p>DIN rail 160 mm 482 mm 530 mm 830 mm 2000 mm</p> <p>PROFIBUS FastConnect bus cable Standard type with special design for quick assembly, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m</p>	<p>6ES7972-0DA60-0XA0</p> <p>6ES7972-0BA30-0XA0</p> <p>6ES7390-1AB60-0AA0</p> <p>6ES7390-1AE80-0AA0</p> <p>6ES7390-1AF30-0AA0</p> <p>6ES7390-1AJ30-0AA0</p> <p>6ES7390-1BC00-0AA0</p> <p>6XV1830-0EH10</p>

Design



ET 200iSP modules can also be installed in stainless steel wall enclosures designed to meet more exacting protection requirements. The enclosures are available in various sizes. They comply with degree of protection IP65 and can be used in Ex zones 1 and 21.

Delivery is possible as an empty enclosure (6DL2804-0....) or including components (6DL2804-1.... or 6DL2804-2....), depending on the order. The ET 200iSP components and AirLINE Ex components (see Catalog "Add-ons for SIMATIC PCS 7") envisaged for installation must be ordered separately and delivered to the following address with reference to the enclosure order:

Siemens AG
I IA CE SE MF_PLAN _CEN
Ms. Vala
(please enter a project name at this position)
Siemensallee 84
D-76187 Karlsruhe, Germany

Ordering data

Article No.

Article No.

Stainless steel enclosure IP65, protection class Ex e, suitable for Ex zones 1 and 21

Empty enclosure without installation of modules, for use in gas area (zones 1 and 2), IP65

Enclosure with hinged cover 650 x 450 x 230

For the installation of max. 15 ET 200iSP modules, for use in gas area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets:

- 2 x M32 for infeed, 4 x M20 for bus cables, 39 x M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic
- 2 x M32 for infeed, 4 x M20 for bus cables, 39 x M16 (3 rows) for signal lines, and 2 rows of blanking plugs, all cable inlets of metal, for extended temperature range -40 ... +70 °C

6DL2804-0AD30

6DL2804-0AD31

- 2 x M32 for infeed, 4 x M20 for bus cables, 39 x M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic

6DL2804-0AD32

- 2 x M32 for infeed, 4 x M20 for bus cables, 36 x M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic

6DL2804-0AD42

- 2 x M32 for infeed, 4 x M20 for bus cables, 65 x M16 (5 rows) for signal lines, all cable inlets of black plastic

6DL2804-0AD50

- 2 x M32 for infeed, 4 x M20 for bus cables, 65 x M16 (5 rows) for signal lines, all cable inlets of metal, for extended temperature range -40 ... +70 °C

6DL2804-0AD51

- 2 x M32 for infeed, 4 x M20 for bus cables, 65 x M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic

6DL2804-0AD52

- 2 x M32 for infeed, 4 x M20 for bus cables, 60 x M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic

6DL2804-0AD62

I/O systems

ET 200 systems for the control cabinet

ET 200iSP

Stainless steel wall enclosures**Ordering data****Article No.****Article No.****Enclosure with hinged cover
950 × 450 × 230**

For the installation of max.
25 ET 200iSP modules, for use in
gas area, for temperature range
-20 ... +70 °C, with equipotential
bonding rail and cable inlets:

- 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines, and 2 rows of blanking plugs, all cable inlets of metal, for extended temperature range -40 ... +70 °C
- 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 57 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, all cable inlets of metal, for extended temperature range -40 ... +70 °C
- 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 90 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic

6DL2804-0AE30**6DL2804-0AE31****6DL2804-0AE32****6DL2804-0AE42****6DL2804-0AE50****6DL2804-0AE51****6DL2804-0AE52****6DL2804-0AE62****Empty enclosure without installation of modules, for use in dust area (zones 21 and 22), IP65****Enclosure with hinged cover
650 × 450 × 230**

For the installation of max.
15 ET 200iSP modules, for use in
dust area, for temperature range
-20 ... +70 °C, with equipotential
bonding rail and cable inlets:

- 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 36 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 60 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic

6DL2804-0DD30**6DL2804-0DD32****6DL2804-0DD42****6DL2804-0DD50****6DL2804-0DD52****6DL2804-0DD62**

Ordering data	Article No.	Article No.	
Enclosure with hinged cover 950 × 450 × 230 For the installation of max. 25 ET 200iSP modules, for use in dust area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> • 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 57 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, all cable inlets of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 95 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic 	6DL2804-0DE30 6DL2804-0DE32 6DL2804-0DE42 6DL2804-0DE50 6DL2804-0DE52 6DL2804-0DE62	Enclosure with hinged cover 950 × 450 × 230 For the installation of max. 25 ET 200iSP modules, for use in mining (Cat. M2), for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> • 6 × M25 for infeed, 9 × M32 (1 row) for signal lines, all cable inlets of metal • 6 × M25 for infeed, 18 × M32 (2 rows) for signal lines, all cable inlets of metal 	6DL2804-0ME16 6DL2804-0ME26
Empty enclosure without installation of modules, for use in mining (Cat. M2), IP65		Enclosure with installation of ET 200iSP modules, for use in gas area (zones 1 and 2), IP65¹⁾	
Enclosure with hinged cover 650 × 450 × 230 For the installation of max. 15 ET 200iSP modules, for use in mining (Cat. M2), for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> • 6 × M25 for infeed, 6 × M32 (1 row) for signal lines, all cable inlets of metal • 6 × M25 for infeed, 12 × M32 (2 rows) for signal lines, all cable inlets of metal 	6DL2804-0MD16 6DL2804-0MD26	Enclosure with hinged cover 650 × 450 × 230 For installation of max. 15 ET 200iSP modules, for use in gas area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> • 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines, and 2 rows of blanking plugs, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately) • 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 36 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, all cable inlets of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately) • 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 60 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic 	6DL2804-1AD30 6DL2804-1AD31 6DL2804-1AD32 6DL2804-1AD32 6DL2804-1AD32 6DL2804-1AD32 6DL2804-1AD42 6DL2804-1AD50 6DL2804-1AD51 6DL2804-1AD52 6DL2804-1AD52 6DL2804-1AD62

¹⁾ The ET 200iSP components must be ordered separately.

I/O systems

ET 200 systems for the control cabinet

ET 200iSP

Stainless steel wall enclosures

Ordering data

Enclosure with hinged cover 950 × 450 × 230

For the installation of max. 25 ET 200iSP modules, for use in gas area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets:

- 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines, and 2 rows of blanking plugs, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately)
- 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 57 × M20 (3 rows) for signal lines, and 2 rows of blanking plugs, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately)
- 2 × M32 for infeed, 4 × M20 for bus cables, 57 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately)
- 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 95 × M20 (5 rows) for signal lines, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately)
- 2 × M32 for infeed, 4 × M20 for bus cables, 90 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic

Article No.

6DL2804-1AE30

6DL2804-1AE31

6DL2804-1AE32

6DL2804-1AE41

6DL2804-1AE42

6DL2804-1AE50

6DL2804-1AE51

6DL2804-1AE52

6DL2804-1AE61

6DL2804-1AE62

Article No.

Enclosure with installation of ET 200iSP modules, for use in dust area (zones 21 and 22), IP65¹⁾

Enclosure with hinged cover 650 × 450 × 230

For the installation of max. 15 ET 200iSP modules, for use in dust area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets:

- 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 36 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately)
- 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 60 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic

6DL2804-1DD30

6DL2804-1DD32

6DL2804-1DD42

6DL2804-1DD50

6DL2804-1DD51

6DL2804-1DD52

6DL2804-1DD62

¹⁾ The ET 200iSP components must be ordered separately.

Ordering data	Article No.	Article No.	
<p>Enclosure with hinged cover 950 × 450 × 230 For the installation of max. 25 ET 200iSP modules, for use in dust area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets:</p> <ul style="list-style-type: none"> • 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 57 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, all cable inlets of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic • 2 × M32 for infeed, 4 × M20 for bus cables, 95 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic 	<p>6DL2804-1DE30</p> <p>6DL2804-1DE32</p> <p>6DL2804-1DE42</p> <p>6DL2804-1DE50</p> <p>6DL2804-1DE52</p> <p>6DL2804-1DE62</p>	<p>Enclosure with installation of ET 200iSP modules, for use in mining (Cat. M2), IP65</p> <p>Enclosure with hinged cover 650 × 450 × 230 For the installation of max. 15 ET 200iSP modules, for use in mining (Cat. M2), for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets:</p> <ul style="list-style-type: none"> • 6 × M25 for infeed, 6 × M32 (1 row) for signal lines, all cable inlets of metal • 6 × M25 for infeed, 12 × M32 (2 rows) for signal lines, all cable inlets of metal <p>Enclosure with hinged cover 950 × 450 × 230 For the installation of max. 25 ET 200iSP modules, for use in mining (Cat. M2), for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets:</p> <ul style="list-style-type: none"> • 6 × M25 for infeed, 9 × M32 (1 row) for signal lines, all cable inlets of metal • 6 × M25 for infeed, 18 × M32 (2 rows) for signal lines, all cable inlets of metal 	<p>6DL2804-1MD16</p> <p>6DL2804-1MD26</p> <p>6DL2804-1ME16</p> <p>6DL2804-1ME26</p>

I/O systems

ET 200 systems for the control cabinet

ET 200iSP

Stainless steel wall enclosures

Ordering data	Article No.	Article No.	
Enclosure with installation of ET 200iSP and AirLINE Ex modules, for use in gaseous area (zones 1 and 2), IP65¹⁾		Enclosure with installation of ET 200iSP and AirLINE Ex modules, for use in dusty area (zones 21 and 22), IP65¹⁾	
Enclosure with hinged cover 650 x 450 x 230 For the installation of max. 15 ET 200iSP modules, for use in gas area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> • 2 x M32 for infeed, 4 x M20 for bus cables, 39 x M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic • 2 x M32 for infeed, 4 x M20 for bus cables, 65 x M16 (5 rows) for signal lines, all cable inlets of black plastic • 2 x M32 for infeed, 4 x M20 for bus cables, 60 x M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic 	6DL2804-2AD30 6DL2804-2AD50 6DL2804-2AD62	Enclosure with hinged cover 650 x 450 x 230 For the installation of max. 15 ET 200iSP modules, for use in dust area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> • 2 x M32 for infeed, 4 x M20 for bus cables, 36 x M20 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic 	6DL2804-2DD40
Enclosure with hinged cover 950 x 450 x 230 For the installation of max. 25 ET 200iSP modules, for use in gas area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> • 2 x M32 for infeed, 4 x M20 for bus cables, 66 x M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic • 2 x M32 for infeed, 4 x M20 for bus cables, 110 x M16 (5 rows) for signal lines, all cable inlets of black plastic • 2 x M32 for infeed, 4 x M20 for bus cables, 95 x M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic 	6DL2804-2AE30 6DL2804-2AE50 6DL2804-2AE62	Enclosure with hinged cover 950 x 450 x 230 For installation of max. 25 ET 200iSP modules, for use in dust area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> • 2 x M32 for infeed, 4 x M20 for bus cables, 57 x M20 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic • 2 x M32 for infeed, 4 x M20 for bus cables, 110 x M16 (5 rows) for signal lines, all cable inlets of black plastic 	6DL2804-2DE40 6DL2804-2DE50
		Special configurations See the section "Options".	

¹⁾ The AirLINE Ex components (see catalog "Add-ons for SIMATIC PCS 7") and the ET 200iSP components must be ordered separately.

Options

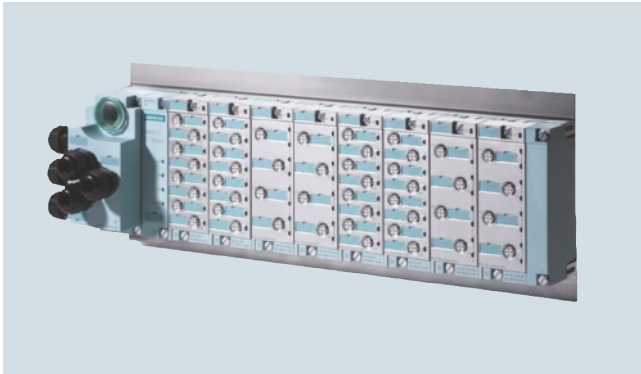
Special configurations

For all configurations which deviate from the described standard configurations the Article no. **6DL5711-8AB** must be listed as an additional order number alongside one of the specified basic article numbers.

The following additional information must be appended to the article number:

- Specification/description of the supplementary service and/or
- Reference to an offer

Overview



- SIMATIC ET 200pro distributed I/O system with IP65/67 degree of protection 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
- Transmission rate for PROFIBUS DP 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 motor starters
- Fail-safe modules with safety-related signal processing according to PROFIsafe
- Frequency converters
- RFID communication modules
- Pneumatic interface modules

Technical specifications

General technical specifications	
Electronic modules	<ul style="list-style-type: none"> • Digital inputs/outputs • Analog inputs • Analog outputs
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
Load current for ET 200pro per incoming supply (IM, PM, switched voltage), up to 55 °C, max.	10 A
For overall configuration with looping through (multiple ET 200pros), 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)

Environmental conditions	
Temperature	From -25 °C/0 °C to +55 °C
Relative humidity	From 5 to 100%
Air pressure	From 795 to 1080 hPa
Mechanical stress	
• Vibration	Vibration test according to IEC 60068, Part 2-6 (sinusoidal) <ul style="list-style-type: none"> • Constant acceleration 5 g, occasionally 10 g for interface, digital and analog modules • 2 g motor starters
• Shock	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"> • 15 g, 11 ms duration for motor starters
Approvals	UL, CSA or cULus

I/O systems

ET 200 systems without control cabinet

ET 200pro – Interface modules

IM 154-1 and IM 154-2

Overview



Interface modules for handling communication between the ET 200pro and the higher-level master over PROFIBUS DP.

Technical specifications

Article number	6ES7154-1AA01-0AB0	6ES7154-2AA01-0AB0
	ET200PRO, IM 154-1 DP	ET200PRO, IM154-2 DP HF
Product type designation		
General information		
Vendor identification (VendorID)	8118H	8119H
Supply voltage		
Rated value (DC)		
• 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
Load voltage 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
Input current		
from supply voltage 1L+, max.	200 mA	200 mA
Power losses		
Power loss, typ.	5 W	5 W
Address area		
Addressing volume		
• Inputs	244 byte	244 byte
• Outputs	244 byte	244 byte
PROFIBUS DP		
• Automatic detection of transmission speed	Yes	Yes

Technical specifications (continued)

Article number	6ES7154-1AA01-0AB0 ET200PRO, IM 154-1 DP	6ES7154-2AA01-0AB0 ET200PRO, IM154-2 DP HF
1st interface		
Interface type	PROFIBUS DP	PROFIBUS DP
Physics	RS 485	RS 485
Functionality		
• DP slave	Yes	Yes
DP slave		
• Transmission rate, min.	9.6 kbit/s	9.6 kbit/s
• Transmission rate, max.	12 Mbit/s	12 Mbit/s
Services		
- SYNC/FREEZE	Yes	Yes
- Direct data exchange (slave-to-slave communication)	Yes	Yes
Interrupts/diagnostics/ status information		
Diagnostics 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 DC 24 V (green)	Yes	Yes
Parameter		
DPV1 operation	possible	possible
Hardware interrupt	Parameterizable	Parameterizable
Swapping interrupt	Parameterizable	Parameterizable
Startup if setpoint not equal to actual configuration	Parameterizable	Parameterizable
Galvanic isolation		
between supply voltage and electronics	Yes	Yes
Isolation		
Isolation checked with	500 V DC	500 V DC
Degree and class of protection		
Degree of protection to EN 60529		
• IP67	Yes	Yes
Ambient conditions		
Ambient temperature in operation		
• Min.	-25 °C	-25 °C
• max.	55 °C	55 °C
Storage/transport temperature		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Dimensions		
Width	90 mm	90 mm
Height	130 mm	130 mm
Depth	59.3 mm	59.3 mm
Weights		
Weight, approx.	375 g	375 g

I/O systems

ET 200 systems without control cabinet

ET 200pro – Interface modules

IM 154-1 and IM 154-2

Ordering data	Article No.	Ordering data	Article No.
IM154-1 interface module For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP.	6ES7154-1AA01-0AB0	PROFIBUS ECOFAST hybrid cable GP, preassembled With 2 ECOFAST connectors, trailing-type cable with 2 x CU 0.64 mm ² and 4 x Cu 1.5 mm ² , in various lengths:	
IM154-2 DP High Feature interface module For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP; supports PROFI-safe.	6ES7154-2AA01-0AB0	1.5 m	6XV1860-3PH15
		3.0 m	6XV1860-3PH30
		5.0 m	6XV1860-3PH50
		10 m	6XV1860-3PN10
		15 m	6XV1860-3PN15
		20 m	6XV1860-3PN20
		25 m	6XV1860-3PN25
		30 m	6XV1860-3PN30
		35 m	6XV1860-3PN35
		40 m	6XV1860-3PN40
		45 m	6XV1860-3PN45
		50 m	6XV1860-3PN50
Accessories		PROFIBUS ECOFAST hybrid cable, non-assembled Trailing-type cable with 2 x CU 0.64 mm ² and 4 x Cu 1.5 mm ² , in various lengths:	
CM IM DP ECOFAST connection module For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 ECOFAST Cu connections.	6ES7194-4AA00-0AA0	50 m	6XV1830-7AN50
CM IM DP direct connection module For connecting PROFIBUS DP and the 24 V power supply directly to PROFIBUS interface modules, up to six M20 cable glands.	6ES7194-4AC00-0AA0	100 m	6XV1830-7AT10
CM IM DP M12, 7/8" connection module For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 x M12 and 2 x 7/8".	6ES7194-4AD00-0AA0	PROFIBUS ECOFAST hybrid cable GP, non-assembled Trailing-type cable with 2 x CU 0.64 mm ² and 4 x Cu 1.5 mm ² , in various lengths:	
Accessories for CM IM DP ECOFAST		50 m	6XV1860-4PN50
PROFIBUS ECOFAST hybrid cable, preassembled With 2 ECOFAST connectors, trailing-type cable with 2 x CU 0.64 mm ² and 4 x Cu 1.5 mm ² , in various lengths:		100 m	6XV1860-4PT10
1.5 m	6XV1830-7BH15	PROFIBUS ECOFAST hybrid connector 180 ECOFAST Cu, 2 x Cu, 4 x 1.5 mm ² , HANBRID connector	
3.0 m	6XV1830-7BH30	<ul style="list-style-type: none"> • With male insert, 5-pack • With female insert, 5-pack 	6GK1905-0CA00
5.0 m	6XV1830-7BH50		6GK1905-0CB00
10 m	6XV1830-7BN10		
15 m	6XV1830-7BN15		
20 m	6XV1830-7BN20		
25 m	6XV1830-7BN25		
30 m	6XV1830-7BN30		
35 m	6XV1830-7BN35		
40 m	6XV1830-7BN40		
45 m	6XV1830-7BN45		
50 m	6XV1830-7BN50		

Ordering data	Article No.	Ordering data	Article No.
PROFIBUS ECOFAST hybrid connector angular ECOFAST Cu, 2 x Cu, 4 x 1.5 mm ² , HANBRID connector <ul style="list-style-type: none"> • With male insert, 5-pack • With female insert, 5-pack 	6GK1905-0CC00 6GK1905-0CD00	Accessories for CM IM DP M12, 7/8" PROFIBUS M12 connecting cable Preassembled with two M12 connectors, 5-pin, in various lengths: <ul style="list-style-type: none"> 1.5 m 2.0 m 3.0 m 5.0 m 10 m 15 m 	6XV1830-3DH15 6XV1830-3DH20 6XV1830-3DH30 6XV1830-3DH50 6XV1830-3DN10 6XV1830-3DN15
Accessories for CM IM DP direct PROFIBUS trailing cable Max. acceleration 4 m/s ² , at least 3 000 000 bending cycles, bending radius at least 60 mm, 2-core shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1830-3EH10	7/8" connecting cable to power supply 5-core, 5 x 1.5 mm ² , trailing type, preassembled with two 7/8" connectors, 5-pin, in various lengths: <ul style="list-style-type: none"> 1.5 m 2.0 m 3.0 m 5.0 m 10 m 15 m 	6XV1822-5BH15 6XV1822-5BH20 6XV1822-5BH30 6XV1822-5BH50 6XV1822-5BN10 6XV1822-5BN15
PROFIBUS FC Food bus cable With PE sheath for use in the food and beverages industry, 2-core, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1830-0GH10	M12 cable connector For ET 200eco, with axial cable outlet. <ul style="list-style-type: none"> • With male insert, 5-pack • With female insert, 5-pack 	6GK1905-0EA00 6GK1905-0EB00
PROFIBUS FC Robust bus cable With PUR sheath for use in environments subject to harsh chemicals and extreme mechanical stress, 2-core, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1830-0JH10	PROFIBUS M12 bus termination connector With male insert.	6GK1905-0EC00
Power line 5-core, 5 x 1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1830-8AH10	7/8" cable connector For ET 200eco, with axial cable outlet. <ul style="list-style-type: none"> • With male insert, 5-pack • With female insert, 5-pack 	6GK1905-0FA00 6GK1905-0FB00
		M12 sealing cap For protection of unused M12 connections with ET 200pro.	3RX9802-0AA00
		Sealing cap 7/8" For protection of unused 7/8" connections with ET 200pro; 10 units per pack.	6ES7194-3JA00-0AA0

I/O systems

ET 200 systems without control cabinet

ET 200pro – Interface modules

IM 154-1 and IM 154-2

Ordering data	Article No.	Article No.
General accessories		
ET 200pro rack		
<ul style="list-style-type: none"> Narrow, for interface, electronics and power modules <ul style="list-style-type: none"> - 500 mm - 1000 mm - 2000 mm, can be cut to length Compact, for interface, electronics and power modules <ul style="list-style-type: none"> - 500 mm - 1000 mm - 2000 mm, can be cut to length Wide, for interface, electronics, power modules and motor starters <ul style="list-style-type: none"> - 500 mm - 1000 mm - 2000 mm, can be cut to length Wide, for I/O modules and motor starters <ul style="list-style-type: none"> - 500 mm - 1000 mm - 2000 mm 	6ES7194-4GA00-0AA0 6ES7194-4GA60-0AA0 6ES7194-4GA20-0AA0 6ES7194-4GC70-0AA0 6ES7194-4GC60-0AA0 6ES7194-4GC20-0AA0 6ES7194-4GB00-0AA0 6ES7194-4GB60-0AA0 6ES7194-4GB20-0AA0 6ES7194-4GD00-0AA0 6ES7194-4GD10-0AA0 6ES7194-4GD20-0AA0	
Spare fuse	6ES7194-4HB00-0AA0	
12.5 A fast-blow, for interface and power modules, 10 units per pack.		
PROFIBUS FastConnect bus cable	6XV1830-0EH10	
Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m.		
		PROFIBUS Hybrid Standard Cable GP
		Standard PROFIBUS hybrid cable with 2 energy cables (1.5 mm ²) for supplying data and energy for ET 200pro.
		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).
		SIMATIC Manual Collection – Update service for 1 year
		Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates.
		6XV1860-2R
		6ES7998-8XC01-8YE0
		6ES7998-8XC01-8YE2

Overview



Interface module for processing the communication between ET 200pro and a higher-level controller over PROFINET IO.

Technical specifications

Article number	6ES7154-4AB10-0AB0 ET200PRO, IM 154-4 PN HF
Product type designation	
General information	
Vendor identification (VendorID)	0x002A
Device identifier (DeviceID)	0x0305
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V; Unit [V]
permissible range, upper limit (DC)	28.8 V; Unit [V]
Load voltage 1L+	
• Rated value (DC)	24 V
• short-circuit protection	Yes; Fuse in lower part is exchangeable, the fuse on the IM-LP is not
• Reverse polarity protection	Yes; against destruction
Input current	
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
Power losses	
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
Memory	
Micro Memory Card	No; Internal memory medium

Article number	6ES7154-4AB10-0AB0 ET200PRO, IM 154-4 PN HF
Address area	
Addressing volume	
• Inputs	256 byte
• Outputs	256 byte
Interfaces	
PROFINET IO	
• Automatic detection of transmission speed	Yes
• Transmission rate, max.	100 Mbit/s
• Services	ARP, PING, SNMP
Protocols	
PROFINET IO	Yes
Interrupts/diagnostics/status information	
Diagnostics 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

I/O systems

ET 200 systems without control cabinet

ET 200pro – Interface modules

IM 154-4 PN

Technical specifications (continued)

Article number	6ES7154-4AB10-0AB0 ET200PRO, IM 154-4 PN HF	
Parameter		
Diagnostic alarm	1	
Hardware interrupt	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	
Galvanic isolation		
between backplane bus and electronics	No	
between supply voltage and electronics	Yes	
Isolation		
Isolation checked with	500 V DC	

Article number	6ES7154-4AB10-0AB0 ET200PRO, IM 154-4 PN HF	
Degree and class of protection		
Degree of protection to EN 60529		
• IP65	Yes	
• IP66	Yes	
• IP67	Yes	
Ambient conditions		
Ambient temperature in operation		
• Min.	-25 °C	
• max.	55 °C	
Storage/transport temperature		
• Min.	-40 °C	
• max.	70 °C	
Dimensions		
Width	135 mm	
Height	130 mm	
Depth	59.3 mm	
Weights		
Weight, approx.	490 g	

Ordering data

Article No.

IM 154-4 PN High Feature interface module	6ES7154-4AB10-0AB0
For communication between ET 200pro and higher-level controllers over PROFINET IO; support of PROFI-safe.	
Accessories	
CM IM PN connection module M12, 7/8"	6ES7194-4AJ00-0AA0
For connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8".	
CM IM PN connection module 2xRJ45	6ES7194-4AF00-0AA0
For connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x RJ45 and 2 x push-pull power connector.	
CM IM PN 2xSCRJ FO connection module	6ES7194-4AG00-0AA0
For connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x SCRJ FO and 2 x push-pull power connector.	

Article No.

M12 sealing cap	3RX9 802-0AA00
For protection of unused M12 connections with ET 200pro.	
IE M12 connecting cables	
Preassembled with two M12 connectors, up to 85 m, in various lengths:	
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
Other special lengths with 90° or 180° cable outlet.	See http://support.automation.siemens.com/WWW/view/en/26999294
7/8" sealing caps	6ES7194-3JA00-0AA0
1 pack = 10 units	

Ordering data	Article No.	Article No.	
7/8" connecting cable to power supply 5-core, 5 x 1.5 mm ² , trailing type, preassembled with two 7/8" connectors, 5-pin, up to 50 m, in various lengths: 1.5 m 2.0 m 3.0 m 5.0 m 10 m 15 m 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 http://support.automation.siemens.com/WWW/view/en/26999294	IE RJ45 Plug PRO RJ45 plug in IP65/67-rated design for on-site assembly, plastic housing, insulation/displacement connection system, for SCALANCE X-200IRT PRO and ET200pro; 1 pack = 1 unit.	6GK1901-1BB10-6AA0
Power line 5-core, 5 x 1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1 830-8AH10	IE SC RJ POF Plug PRO SC RJ plug for POF fibers in IP65/67-rated design for on-site assembly, plastic housing, for SCALANCE X-200IRT PRO and ET200pro; 1 pack = 1 unit.	6GK1900-0MB00-6AA0
7/8" cable connector For ET 200eco, with axial cable outlet. <ul style="list-style-type: none"> • With male insert, 5-pack • With female insert, 5-pack 	6GK1 905-0FA00 6GK1 905-0FB00	IE SC RJ PCF Plug PRO SC RJ plug connector for PCF fibers in IP65/67-rated design for on-site assembly, plastic housing, for SCALANCE X-200IRT PRO; 1 pack = 1 unit.	6GK1900-0NB00-6AA0
Industrial Ethernet FastConnect installation cables <ul style="list-style-type: none"> • IE FC TP Standard Cable GP 2 x 2; Sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m. • IE FC TP Trailing Cable 2 x 2; Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m. • IE FC TP Trailing Cable GP 2 x 2; Sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m. • IE TP Torsion Cable GP 2 x 2; Sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m. • IE FC TP Marine Cable 2 x 2; Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m. 	6XV1 840-2AH10 6XV1 840-3AH10 6XV1 870-2D 6XV1 870-2F 6XV1 840-4AH10	Power Plug PRO 5-pin 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; 1 pack = 1 unit.	6GK1907-0AB10-6AA0
		IE panel feedthrough Control cabinet feedthrough for converting M12 D-coded connection system (IP65) to RJ45 connection system (IP20). <ul style="list-style-type: none"> • 1 pack = 5 units 	6GK1 901-0DM20-2AA5
		Push-pull cable connector For 1L+/ 2L+, unassembled	6GK1 907-0AB10-6AA0
		Cover caps for Push-pull RJ45 female connectors 5 items per pack	6ES7194-4JD50-0AA0

I/O systems

ET 200 systems without control cabinet

ET 200pro – Interface modules

IM 154-4 PN

Ordering data	Article No.	Ordering data	Article No.
General accessories		Spare fuse	6ES7194-4HB00-0AA0
ET 200pro rack		12.5 A fast-blow, for interface and power modules, 10 units per pack.	
• Narrow, for interface, electronics and power modules		SIMATIC Manual Collection	6ES7998-8XC01-8YE0
- 500 mm	6ES7194-4GA00-0AA0	Electronic manuals on DVD, multi-language:	
- 1000 mm	6ES7194-4GA60-0AA0	S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools,	
- 2000 mm, can be cut to length	6ES7194-4GA20-0AA0	Runtime Software, SIMATIC DP (distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication).	
• Compact, for interface, electronics and power modules		SIMATIC Manual Collection – Update service for 1 year	6ES7998-8XC01-8YE2
- 500 mm	6ES7194-4GC70-0AA0	Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates.	
- 1000 mm	6ES7194-4GC60-0AA0		
- 2000 mm, can be cut to length	6ES7194-4GC20-0AA0		
• Wide, for interface, electronics, power modules and motor starters			
- 500 mm	6ES7194-4GB00-0AA0		
- 1000 mm	6ES7194-4GB60-0AA0		
- 2000 mm, can be cut to length	6ES7194-4GB20-0AA0		
• Wide, for I/O modules and motor starters			
- 500 mm	6ES7194-4GD00-0AA0		
- 1000 mm	6ES7194-4GD10-0AA0		
- 2000 mm	6ES7194-4GD20-0AA0		

Overview



Interface module IM 154-6 PN IWLAN for handling communication between ET 200pro and host PROFINET IO controller over Industrial Wireless LAN (IWLAN) wireless 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 replacement of devices through use of the SIMATIC Micro Memory Card swap medium
- With country permit for USA only

Technical specifications

IM 154-6 PN IWLAN interface module	6ES7154-6AB50-0AB0
Supply voltage for electronic components 1L+	
• Rated value	24 V DC
• Valid range, lower limit	20.4 V DC
• Valid range, upper limit	28.8 V DC
• Short-circuit protection	Yes; replaceable fuse
• Reverse polarity protection	Yes; against destruction
• Max. infeed current	5 A
Load voltage 2L+	
• Rated value (DC)	24 V DC
• Lower limit of permissible range (DC)	20.4 V DC
• Upper limit of permissible range (DC)	28.8 V DC
• Short-circuit protection	Yes, for potential group
• Reverse polarity protection	Yes; against destruction
• Max. infeed current	8 A
Current consumption from supply voltage 1L+, typ.	335 mA
Power loss, typ.	8.5 W
Memory type	Micro Memory Card, is required
Address range/address volume	
• Outputs	256 byte
• Inputs	256 byte
Reports	
• PROFINET IO	Yes
• Industrial Wireless LAN	Yes

IM 154-6 PN IWLAN interface module	6ES7154-6AB50-0AB0
PROFINET IO services	ARP, PING, SNMP
Industrial Wireless LAN	
• Transmission rate, max.	54 Mbit/s
• Standards for wireless communication	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11e IEEE 802.11i
• Radio frequency for WLAN in 2.4 GHz frequency band	2,4 ... 2.4835 GHz
• Radio frequency for WLAN in 5 GHz frequency band	5,15 ... 5.825 GHz
• Transmission method	Direct Sequence Spread Spectrum (DSSS) Complementary Code Keying (CCK) Orthogonal Frequency Division Multiplexing (OFDM)
• Supported IWLAN services	Current approvals can be found in the Internet at http://support.automation.siemens.com/WW/view/en/19812553
• Connection for external antenna	

I/O systems

ET 200 systems without control cabinet
ET 200pro – Interface modules

IM 154-6 PN IWLAN

Technical specifications (continued)

IM 154-6 PN IWLAN interface module	6ES7154-6AB50-0AB0	IM 154-6 PN IWLAN interface module	6ES7154-6AB50-0AB0
Parameters		Isolation	
• Diagnostic interrupt	Yes	• Between the backplane bus and supply voltage 1L+ and 2L+	Yes
• Maintenance alarm	Yes	• Between Ethernet and supply voltage 1L+ and 2L+	Yes
• Hardware interrupt	Yes	• Between the supply voltage and electronic components	Yes
• Swapping interrupt	Yes	Operating temperature	
• Identifier-related diagnostic data	Yes	• Minimum	-25 °C
• Module status	Yes	• Maximum	55 °C
• Channel-specific diagnostics	Yes	Storage/transport temperature	
• Start-up if preset configuration is not equal to actual configuration	Yes	• Minimum	-40 °C
• Module replacement during operation	Yes	• Maximum	70 °C
Diagnostics indication (LED)	Yes	Degree of protection	IP65, IP66, IP67
• Group fault (red)	Yes	General information	
• Bus fault (red)	Yes	• Manufacturer's code (VendorID)	0x002A
• Maintenance information (yellow)	Yes	• Device ID	0x0305
• Monitoring 24 V power supply ON (green)	Yes	Dimensions	
• Load voltage monitoring 24 V DC (green)	Yes	• Width	135 mm
• Connection to an Access Point R1 LINK (green)	Yes	• Height	130 mm
• Data exchange R1 RX/TX (yellow)	Yes	• Depth	60 mm
• Connection to a PG/PC (green)	Yes	Weight, approx.	1085 g
• Data exchange with a PG/PC (yellow)	Yes		
Insulation tested at	500 V DC		

Ordering data

Article No.

Article No.

IM 154-6 PN HF IWLAN interface module

For communication between ET 200pro and higher-level controllers over Industrial Wireless LAN (IWLAN) radio networks; support of PROFINet.

With country permit for USA

6ES7154-6AB50-0AB0

Antennas with omnidirectional characteristic

Mounting directly on IM154-6 PN HF IWLAN

• ANT IM 154-6 IWLAN; 2 units

6ES7194-4MA00-0AA0

For wall or mast mounting

• ANT 792-6MN; rod antenna N-Connect female 2.4 GHz; 1 unit

6GK5792-6MN00-0AA6

• ANT793-6MN; rod antenna N-Connect female 5 GHz; 1 unit

6GK5793-6MN00-0AA6

For use with the RCoax antenna system

• ANT 792-4DN; RCoax N-Connect female 2.4 GHz; 1 unit

6GK5792-4DN00-0AA6

• ANT793-4MN; RCoax N-Connect female 5 GHz; 1 unit

6GK5793-4MN00-0AA6

Antenna cables IWLAN RCoax; N-Connect / R-SMA

1 m

6XV1875-5CH10

2 m

6XV1875-5CH20

5 m

6XV1875-5CH50

10 m

6XV1875-5CN10

IWLAN terminating resistor 50 ohms for second R-SMA antenna socket, 3 units.

6GK5795-1TR10-0AA6

Accessories

7/8" connecting cable to power supply

5-core, 5 x 1.5 mm², trailing type, preassembled with two 7/8" connectors, in various lengths:

1.5 m

6XV1822-5BH15

2.0 m

6XV1822-5BH20

3.0 m

6XV1822-5BH30

5.0 m

6XV1822-5BH50

10 m

6XV1822-5BN10

15 m

6XV1822-5BN15

Other special lengths with 90° or 180° cable outlet.

see <http://support.automation.siemens.com/WW/view/en/26999294>

Power line

6XV1830-8AH10

5-core, 5 x 1.5 mm², trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.

7/8" cable connector

6GK1905-0FB00

For ET 200eco, with axial cable outlet; with female contact insert, pack of 5.

Twisted Pair cables 4x2 with RJ45 connectors

0.5 m

6XV1870-3QE50

1 m

6XV1870-3QH10

2 m

6XV1870-3QH20

6 m

6XV1870-3QH60

10 m

6XV1870-3QN10

Ordering data	Article No.	Article No.
Crossed Twisted Pair cables 4x2 with RJ45 connectors 0.5 m 1 m 2 m 6 m 10 m	6XV1870-3RE50 6XV1870-3RH10 6XV1870-3RH20 6XV1870-3RH60 6XV1870-3RN10	General accessories ET 200pro module rack <ul style="list-style-type: none"> Narrow, for interface, electronics and power modules <ul style="list-style-type: none"> 500 mm 1000 mm 2000 mm, can be cut to length Compact, for interface, electronics and power modules <ul style="list-style-type: none"> 500 mm 1000 mm 2000 mm, can be cut to length Wide, for interface, electronics, power modules and motor starters <ul style="list-style-type: none"> 500 mm 1000 mm 2000 mm, can be cut to length Wide, for I/O modules and motor starters <ul style="list-style-type: none"> 500 mm 1000 mm 2000 mm
IE FC RJ45 Plug 180 180° cable outlet; for line components and CPs/CPUs with Industrial Ethernet interface. <ul style="list-style-type: none"> 1 pack = 1 unit 1 pack = 10 units 	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0	6ES7194-4GA00-0AA0 6ES7194-4GA60-0AA0 6ES7194-4GA20-0AA0 6ES7194-4GC70-0AA0 6ES7194-4GC60-0AA0 6ES7194-4GC20-0AA0 6ES7194-4GB00-0AA0 6ES7194-4GB60-0AA0 6ES7194-4GB20-0AA0 6ES7194-4GD00-0AA0 6ES7194-4GD10-0AA0 6ES7194-4GD20-0AA0
IE FC RJ45 Plug 90 90° cable outlet; e.g. for ET 200S. <ul style="list-style-type: none"> 1 pack = 1 unit 1 pack = 10 units 	6GK1901-1BB20-2AA0 6GK1901-1BB20-2AB0	6ES7194-4HB00-0AA0
		Spare fuse 12.5 A quick-response, for interface and power modules, 10 units per pack.
		Labels 20 x 7 mm, pale turquoise, 340 units per pack.
		SIMATIC Micro Memory Card <ul style="list-style-type: none"> 64 KB 128 KB 512 KB
		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).
		SIMATIC Manual Collection – Update service for 1 year Product package: Current DVD "S7 Manual Collection" and the three subsequent updates.

I/O systems

ET 200 systems without control cabinet

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
- IO connection modules are available in metal and plastic versions

Technical specifications

Article number	6ES7141-4BF00-0AA0 ET200PRO, EM 8DI 24V DC	6ES7141-4BF00-0AB0 ET200PRO, EM 8DI 24V DC HF	6ES7141-4BH00-0AA0 ET200PRO, EM 16DI DC 24V
Product type designation			
FH technology			
Module for failsafe applications	No	No	No
Supply voltage			
Rated value (DC)			
• 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; 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
Input current			
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
Encoder supply			
Number of outputs	8	8	8
Output current			
• up to 55 °C, max.	1 A	1 A	1 A
Power losses			
Power loss, typ.	2.5 W	2.5 W	3 W
Address area			
Occupied address area			
• Inputs	1 byte	1 byte	2 byte

Technical specifications (continued)

Article number	6ES7141-4BF00-0AA0 ET200PRO, EM 8DI 24V DC	6ES7141-4BF00-0AB0 ET200PRO, EM 8DI 24V DC HF	6ES7141-4BH00-0AA0 ET200PRO, EM 16DI DC 24V
Digital inputs			
Number of digital inputs	8	8	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes	No	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No	Yes	
Number of simultaneously controllable inputs			
all mounting positions			
- up to 55 °C, max.	8	8	16
Input voltage			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	+11 to +30V	+11 to +30V
Input current			
• for signal "1", typ.	7 mA	7 mA	4 mA
Input delay (for rated value of input voltage)			
for standard inputs			
- Parameterizable	No	Yes	No
- at "0" to "1", min.	1.2 ms	0.5 ms; 0.5 ms/ 3ms/ 15 ms/ 20 ms	1.2 ms
- at "0" to "1", max.	4.8 ms	20 ms	4.8 ms
- at "1" to "0", min.	1.2 ms	0.5 ms; 0.5 ms/ 3ms/ 15 ms/ 20 ms	0.7 ms
- at "1" to "0", max.	4.8 ms	20 ms	3 ms
Cable length			
• shielded, max.	30 m	30 m	30 m
• Unshielded, max.	30 m	30 m	30 m
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	No	No	No
Interrupts/diagnostics/status information			
Diagnostic messages			
• Diagnostic functions	Yes	Yes; channel by channel, parameterizable	Yes
• Diagnostic information readable	Yes	Yes	Yes
• Wire break		Yes; Monitoring, I < 0.3 mA	
• Short circuit	Yes; Sensor supply to M; module by module	Yes	Yes; Sensor supply to M; module by module
• Group error			Yes
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital input (green)	Yes; Per channel	Yes; Per channel	Yes; Per channel

I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

Digital expansion modules

Technical specifications (continued)

Article number	6ES7141-4BF00-0AA0 ET200PRO, EM 8DI 24V DC	6ES7141-4BF00-0AB0 ET200PRO, EM 8DI 24V DC HF	6ES7141-4BH00-0AA0 ET200PRO, EM 16DI DC 24V
Parameter			
Diagnostic alarm		Yes	
Hardware interrupt		for 6 channels	
Diagnosis: wire break		channel by channel	
Diagnosis: short circuit	Sensor supply to M; module by module	channel by channel	
Galvanic isolation			
Galvanic isolation digital inputs			
• between the channels	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes
Permissible potential difference			
between different circuits	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
Isolation			
Isolation checked with	500 V DC	500 V DC	500 V DC
Degree and class of protection			
Degree of protection to EN 60529			
• IP65	Yes	Yes	Yes
• IP66	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
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
Weights			
Weight, approx.	140 g	140 g	140 g
Article number	6ES7142-4BD00-0AA0 ET200PRO, EM 4DO 24V DC/2.0A	6ES7142-4BD00-0AB0 ET200PRO, EM 4DO 24VDC/2.0A HF	6ES7142-4BF00-0AA0 ET200PRO, EM 8DO DC24V/0.5A
Product type designation			
FH technology			
Module for failsafe applications	No	No	No
Supply voltage			
Load voltage 2L+			
• Rated value (DC)	24 V	24 V	24 V
• short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; against destruction; load increasing
Input current			
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
Power losses			
Power loss, typ.	2 W	2.5 W	2 W
Address area			
Address space per module			
• with packing	4 bit	4 bit	8 bit
• without packing	1 byte	1 byte	1 byte

Technical specifications (continued)

Article number	6ES7142-4BD00-0AA0 ET200PRO, EM 4DO 24V DC/2.0A	6ES7142-4BD00-0AB0 ET200PRO, EM 4DO 24VDC/2.0A HF	6ES7142-4BF00-0AA0 ET200PRO, EM 8DO DC24V/0.5A
Digital outputs			
Number of digital outputs	4	4	8
short-circuit protection	Yes	Yes	Yes
• Response threshold, typ.	3	3	0,7
Limitation of inductive shutdown voltage to	2L+ (-47 V)	2L+ (-47 V)	2L+ (-47 V)
Controlling a digital input	Yes	Yes	Yes; Isolation between 1L+ and 2L+ is no longer provided, as 1M and 2M are jumpered
Switching capacity of the outputs			
• on lamp load, max.	10 W	10 W	5 W
Load resistance range			
• lower limit	12 Ω	12 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
Output voltage			
• for signal "1", min.	2L+ (-0,8 V)	2L+ (-0,8 V)	2L+ (-0,8 V)
Output current			
• for signal "1" rated value	2 A	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
Parallel switching of 2 outputs			
• for increased power	No	No	No
• for redundant control of a load	Yes	Yes	Yes
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz
Aggregate current of outputs (per group)			
all mounting positions - up to 55 °C, max.	4 A	4 A	4 A
Cable length			
• shielded, max.	30 m	30 m	30 m
• Unshielded, max.	30 m	30 m	30 m
Interrupts/diagnostics/status information			
Substitute values connectable		Yes	
Alarms			
• Diagnostic alarm		Yes	
Diagnostic messages			
• Diagnostic functions	Yes	Yes	Yes
• Diagnostic information readable	Yes	Yes	Yes
• Wire break		Yes	
• Short circuit	Yes; Short-circuit of outputs to ground; module by module	Yes	Yes; Short-circuit of outputs to ground; module by module
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes
• Channel error indicator F (red)		Yes	

I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

Digital expansion modules**Technical specifications (continued)**

Article number	6ES7142-4BD00-0AA0 ET200PRO, EM 4DO 24V DC/2.0A	6ES7142-4BD00-0AB0 ET200PRO, EM 4DO 24VDC/2.0A HF	6ES7142-4BF00-0AA0 ET200PRO, EM 8DO DC24V/0.5A
Parameter			
Diagnosis: wire break		channel by channel	
Diagnosis: short circuit		channel by channel	
Behavior on CPU/Master STOP		channel by channel	
Galvanic isolation			
between backplane bus and all other circuit components		Yes	
between the channels and backplane bus		Yes	
Galvanic isolation digital outputs			
• between the channels	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes
Permissible potential difference			
between different circuits		75V DC/60V AC	
Isolation			
Isolation checked with	500 V DC	500 V DC	500 V DC
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
Weights			
Weight, approx.	140 g	140 g	140 g

Article number	6ES7143-4BF50-0AA0 ET200PRO, EM 4DI / 4DO DC 24V, 0.5A	6ES7143-4BF00-0AA0 ET200PRO, EM 4 DIO / 4 DO DC 24V, 0.5A
Product type designation		
Supply voltage		
Rated value (DC)		
• 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
Reverse polarity protection	Yes	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• 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	Yes; against destruction; load increasing
Input current		
from load voltage 1L+ (unswitched voltage)		20 mA
from load voltage 2L+, max.	20 mA	20 mA

Technical specifications (continued)

Article number	6ES7143-4BF50-0AA0 ET200PRO, EM 4DI / 4DO DC 24V, 0.5A	6ES7143-4BF00-0AA0 ET200PRO, EM 4 DIO / 4 DO DC 24V, 0.5A
Encoder supply		
Number of outputs	4	4
Output current		
• nominal	1 A; per module, electronic	1 A; per module, electronic
24 V encoder supply		
• short-circuit protection	Yes; per module, electronic	Yes; per module, electronic
Power losses		
Power loss, typ.	2 W	3 W
Digital inputs		
Number of digital inputs	4	4; 4 DI0s can be parameterized
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs all mounting positions		
- up to 60 °C, max.		4; Up to 55 °C
Input voltage		
• Type of input voltage	DC	DC
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "0", max. (permissible quiescent current)	1.5 mA	1.5 mA
• 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	4.8 ms
- at "1" to "0", max.	3 ms	4.8 ms
Cable length		
• Unshielded, max.	30 m	30 m
Digital outputs		
Number of digital outputs	4	8; 4 DO fixed, 4 DIO parameterizable
• In groups of		4; 2 load groups for 4 outputs each
short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
• Response threshold, typ.	0,7 A	0,7 A
Limitation of inductive shutdown voltage to	Typ. (2L+) -47 V	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• on lamp load, max.	5 W	5 W
Output current		
• for signal "1" rated value	0.5 A	0.5 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	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz
Aggregate current of outputs (per group) all mounting positions		
- up to 55 °C, max.	2 A	2 A
Cable length		
• Unshielded, max.	30 m	30 m

I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

Digital expansion modules**Technical specifications** (continued)

Article number	6ES7143-4BF50-0AA0 ET200PRO, EM 4DI / 4DO DC 24V, 0.5A	6ES7143-4BF00-0AA0 ET200PRO, EM 4 DIO / 4 DO DC 24V, 0.5A
Interrupts/diagnostics/ status information		
Status indicator	Yes; Green LED	Yes; Green LED
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic functions	Yes	Yes
• Diagnostic information readable	Yes	Yes
• Short circuit	Yes; Short-circuit of outputs to ground; module by module	Yes; Short-circuit of outputs to ground; module by module
• Short circuit encoder supply	Yes; per module	Yes; per module
• Group error	Yes	Yes
Galvanic isolation		
between the load voltages	Yes	Yes
between load voltage and all other switching components	Yes	Yes
Galvanic isolation digital inputs		
• between the channels	No	No
Permissible potential difference		
between different circuits	75V DC/60V AC	75V DC/60V AC
Isolation		
tested with		
• 24 V DC circuits	500 V	500 V
Dimensions		
Width	45 mm	45 mm
Height	130 mm	130 mm
Depth	35 mm	35 mm
Weights		
Weight (without packaging)	140 g	140 g

Ordering data	Article No.	Ordering data	Article No.
8 DI digital input module 24 V DC, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7141-4BF00-0AA0	Accessories	
8 DI High Feature digital input module 24 V DC, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7141-4BF00-0AB0	CM IO 4 x M12 connection module 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	6ES7194-4CA00-0AA0
16 DI digital input module 24 V DC, with module-specific diagnostics, including bus module. Connection module 6ES7194-4CB50-0AA0 must be ordered separately	6ES7141-4BH00-0AA0	CM IO 4 x M12 inverse connection module 4 sockets M12 for connection of digital actuators to ET 200pro (4 DO and 4 DO HF); 2 x M12 single assignment, 2 x M12 double assignment	6ES7194-4CA50-0AA0
4 DO digital output module 24 V DC, 2 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BD00-0AA0	CM IO 4 x M12 P connection module 4 M12 sockets for connecting digital sensors/actuators to ET 200pro; plastic version	6ES7194-4CA10-0AA0
4 DO High Feature digital output module 24 V DC, 2 A, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BD00-0AB0	CM IO 8 x M12 connection module 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	6ES7194-4CB00-0AA0
8 DO digital output module 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BF00-0AA0	CM IO 8 x M12 P connection module 8 M12 sockets for connecting digital sensors/actuators to ET 200pro; plastic version	6ES7194-4CB10-0AA0
4 DI/4 DO digital input and output module 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7143-4BF50-0AA0	CM IO 8 x M12D connection module 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	6ES7194-4CB50-0AA0
Digital input and output module 4 DIO / 4 DO 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7143-4BF00-0AA0	CM IO 8 x M8 connection module 8 sockets M8 for connection of digital sensors or actuators to ET 200pro	6ES7194-4EB00-0AA0
		CM IO 2 x M12 connection module 2 M12 8-pin sockets; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A	6ES7194-4FB00-0AA0
		CM IO 1 x M23 connection module 1 socket M23; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A	6ES7194-4FA00-0AA0
		Module identification labels For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	6ES7194-4HA00-0AA0
		M12 sealing cap For protection of unused M12 connections with ET 200pro	3RX9802-0AA00
		Labels 20 x 7, pale turquoise, 340 items per pack	3RT1900-1SB20
		Y circular connector M12 For double connection of sensors via a single cable, 5-pin; cannot be used for F DI 4/8	6ES7194-1KA01-0XA0
		Y cable M12 For double connection of I/O by means of a single-cable on ET200, 5-pin	6ES7194-6KA00-0XA0
		M8 sealing cap For IP 67 modules	3RK1901-1PN00

I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

Analog expansion modules

Overview



- Expansion modules with analog inputs and outputs for connecting sensors/actuators
- With diagnostics functionality, limit values and substitute values

Technical specifications

Article number	6ES7144-4FF01-0AB0	6ES7144-4GF01-0AB0	6ES7144-4JF00-0AB0	6ES7144-4PF00-0AB0
	ET200PRO, EM 4AI-U HF	ET200PRO, EM 4AI-I HF	ET200PRO, EM 4 AI-RTD HF	ET200PRO, EM 4 AI-TC HF
Product type designation				
Supply voltage				
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
Input current				
from load voltage L+ (without load), max.				34 mA; Typical
from backplane bus 3.3 V DC, max.	12 mA; Typical	12 mA; Typical	10 mA; Typical	20 mA; Typical
Encoder supply				
short-circuit protection	Yes; per module, electronic to frame	Yes; per module, electronic to frame		
Power losses				
Power loss, typ.	1.1 W	1.1 W	0.7 W	0.7 W
Address area				
Address space per module				
• Address space per module, max.	8 byte	8 byte	8 byte	8 byte
Analog inputs				
Number of analog inputs	4	4	4	4
permissible input voltage for voltage input (destruction limit), max.	35 V			20 V
permissible input current for current input (destruction limit), max.		40 mA		
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.	5 ms	10 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	

Technical specifications (continued)

Article number	6ES7144-4FF01-0AB0 ET200PRO, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET200PRO, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET200PRO, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET200PRO, EM 4 AI-TC HF
Input ranges				
• Voltage	Yes	No	No	Yes
• Current	No	Yes	No	No
• Thermocouple	No	No	No	Yes
• Resistance thermometer	No	No	Yes	No
• Resistance	No	No	Yes	No
Input ranges (rated values), voltages				
• 0 to +10 V	Yes			
• 1 V to 5 V	Yes			
• -10 V to +10 V	Yes			
• -5 V to +5 V	Yes			
• -80 mV to +80 mV				Yes
• Input resistance (-80 mV to +80 mV)				10 M Ω
Input ranges (rated values), currents				
• 0 to 20 mA		Yes		
• Input resistance (0 to 20 mA)		50 Ω		
• -20 mA to +20 mA		Yes		
• Input resistance (-20 mA to +20 mA)		50 Ω		
• 4 mA to 20 mA		Yes		
• Input resistance (4 mA to 20 mA)		50 Ω		
Input ranges (rated values), thermoelements				
• Type B				Yes
• Input resistance (Type B)				10 M Ω
• Type E				Yes
• Input resistance (Type E)				10 M Ω
• Type J				Yes
• Input resistance (type J)				10 M Ω
• Type K				Yes
• Input resistance (Type K)				10 M Ω
• Type L				Yes
• Input resistance (Type L)				10 M Ω
• Type N				Yes
• Input resistance (Type N)				10 M Ω
• Type R				Yes
• Input resistance (Type R)				10 M Ω
• Type S				Yes
• Input resistance (Type S)				10 M Ω
• Type T				Yes
• Input resistance (Type T)				10 M Ω

I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

Analog expansion modules**Technical specifications** (continued)

Article number	6ES7144-4FF01-0AB0 ET200PRO, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET200PRO, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET200PRO, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET200PRO, EM 4 AI-TC HF
Input ranges (rated values), resistance thermometer				
• Cu 10			No	
• Ni 100			Yes	
• Input resistance (Ni 100)			10 000 kΩ	
• Ni 1000			Yes	
• Input resistance (Ni 1000)			10 000 kΩ	
• Ni 120			Yes	
• Input resistance (Ni 120)			10 000 kΩ	
• Ni 200			Yes	
• Input resistance (Ni 200)			10 000 kΩ	
• 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), resistors				
• 0 to 150 ohms			Yes	
• Input resistance (0 to 150 ohms)			10 000 kΩ	
• 0 to 300 ohms			Yes	
• Input resistance (0 to 300 ohms)			10 000 kΩ	
• 0 to 600 ohms			Yes	
• Input resistance (0 to 600 ohms)			10 000 kΩ	
• 0 to 3000 ohms			Yes	
• Input resistance (0 to 3000 ohms)			10 000 kΩ	
Thermocouple (TC)				
Temperature compensation				
- internal temperature compensation				Yes
- external temperature compensation with compensations socket				Yes
Characteristic linearization				
• Parameterizable			Yes	
- for resistance thermometer			Ptxxx, Nixxx	
Cable length				
• shielded, max.	30 m	30 m	30 m	30 m

Technical specifications (continued)

Article number	6ES7144-4FF01-0AB0 ET200PRO, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET200PRO, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET200PRO, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET200PRO, EM 4 AI-TC HF
Analog value generation for the inputs				
Measurement principle	integrating	integrating	integrating	integrating
Integration and conversion time/resolution per channel				
<ul style="list-style-type: none"> • Resolution with overrange (bit including sign), max. • Integration time (ms) • Interference voltage suppression for interference frequency f1 in Hz • Conversion time (per channel) 	15 bit; 15 bits + sign at ±10 V, at ±5 V; 15 bits at 0 V to 10 V, at 1 V to 5 V 0.3 / 16.7 / 20 / 60 16.67 / 50 / 60 / 3 600 1.1 ms	15 bit; 15 bits + sign at ±10 V, at ±5 V; 15 bits at 0 V to 10 V, at 1 V to 5 V 0.3 / 16.7 / 20 / 60 16.67 / 50 / 60 / 3 600 1.1 ms	15 bit; at 150, 300, 600 and 3000 ohms; otherwise 15 bits + sign 20 / 16.667 50 / 60 Hz 20.625 ms; 20.625 ms at 50 Hz; 17.25 ms at 60 Hz	15 bit; + sign 2.5 / 16.67 / 20 / 100 ms 10 / 50 / 60 / 400 Hz 4.7/19/22/102 ms
Smoothing of measured values				
<ul style="list-style-type: none"> • Parameterizable • Step: None • Step: low • Step: Medium • Step: High 	Yes Yes; 1 x cycle time Yes; 4 x cycle time Yes; 16 x cycle time Yes; 64 x cycle time	Yes Yes; 1 x cycle time Yes; 4 x cycle time Yes; 16 x cycle time Yes; 64 x cycle time	Yes Yes; 1 x cycle time Yes; 4 x cycle time Yes; 16 x cycle time Yes; 64 x cycle time	Yes Yes; 1 x cycle time Yes; 4 x cycle time Yes; 16 x cycle time Yes; 64 x cycle time
Encoder				
Connection of signal encoders				
<ul style="list-style-type: none"> • for current measurement as 2-wire transducer • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection • for resistance measurement with three-wire connection • for resistance measurement with four-wire connection 		Yes Yes	Yes; Line resistances are also measured Yes Yes	
Errors/accuracies				
Linearity error (relative to input range), (+/-)	0.0075 %	0.0075 %	0.05 %	0.01 %
Temperature error (relative to input range), (+/-)	0.00075 %/K	0.00075 %/K	0.002 %/K	0.0004 %/K; Positive temperature
Crosstalk between the inputs, min.	-70 dB	-70 dB	-50 dB	-90 dB; max.
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.004 %	0.004 %	0.015 %	0.01 %
Operational limit in overall temperature range				
<ul style="list-style-type: none"> • Voltage, relative to input area, (+/-) • Current, relative to input area, (+/-) • Resistance thermometer, relative to input area, (+/-) 	0.1 %	0.1 %	0.175 %	0.12 %; Positive temperature
Basic error limit (operational limit at 25 °C)				
<ul style="list-style-type: none"> • Voltage, relative to input area, (+/-) • Current, relative to input area, (+/-) • Resistance thermometer, relative to input area, (+/-) 	0.075 %	0.075 %	0.125 %	0.1 %

I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

Analog expansion modules**Technical specifications (continued)**

Article number	6ES7144-4FF01-0AB0 ET200PRO, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET200PRO, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET200PRO, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET200PRO, EM 4 AI-TC HF
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, $f_1 =$ interference frequency				
<ul style="list-style-type: none"> Series mode interference (peak value of interference < rated value of input range), min. common mode voltage (USS < 2.5 V), min. 			50 dB	42 dB
			70 dB; Interference voltage < 5 V	85 dB; Interference voltage < 10 V
Interference voltage suppression for $f = n \times (f_1 \pm 0.5 \%)$, $f_1 =$ interference frequency				
<ul style="list-style-type: none"> Series mode interference (peak value of interference < rated value of input range), min. common mode voltage (USS < 2.5 V), min. 	60 dB	60 dB		
	80 dB; Interference voltage < 10 V	80 dB; Interference voltage < 5 V		
Interrupts/diagnostics/status information				
Alarms				
<ul style="list-style-type: none"> Diagnostic alarm Limit value alarm Hardware interrupt 	Yes; Parameterizable Yes Yes; (limit value alarm), can be parameterized for channel 0	Yes; Parameterizable Yes Yes; (limit value alarm), can be parameterized for channel 0	Yes; Parameterizable No	Yes; Parameterizable No
Diagnostic messages				
<ul style="list-style-type: none"> Diagnostics Wire break Short circuit Group error Overflow/underflow 	Yes Yes; at 1 to 5 V Yes; at 1 to 5 V Yes	Yes Yes; at 4 to 20 mA Yes; at 4 to 20 mA Yes	Yes Yes Yes Yes	Yes Yes Yes Yes
Diagnostics indication LED				
<ul style="list-style-type: none"> Group error SF (red) 	Yes	Yes	Yes	Yes
Parameter				
Diagnosis: wire break			Yes	Yes
Load voltage			No	
Measurement type/range			R4L / R3L / R2L/ TR4L / TR3L / TR2L	Deactivated/ +/- 80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh-PtRh)/ 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-EL Type L (Fe-CuNi)
Interference frequency suppression			50 / 60 Hz	10 / 50 / 60 / 400 Hz
Group diagnostics			Yes	Yes
Overflow/underflow			Yes	Yes
Comparison point				None/internal/RTD(0)/dyn. ref. temp./fix. ref. temp.
Unit			Degrees C / Degrees F	°C/°F/K
Galvanic isolation				
Galvanic isolation analog inputs				
<ul style="list-style-type: none"> between the channels between the channels and the backplane bus between the channels and the load voltage L+ 	No Yes	No Yes	No Yes	No Yes Yes

Technical specifications (continued)

Article number	6ES7144-4FF01-0AB0 ET200PRO, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET200PRO, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET200PRO, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET200PRO, EM 4 AI-TC HF
Permissible potential difference				
between the inputs (UCM)			5 Vpp AC	20 Vpp AC
between inputs and MANA (UCM)	10 Vpp AC	5 Vpp AC		
between MANA and M internally (UISO)			500 V DC	
Isolation				
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC
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
Weights				
Weight, approx.	150 g	150 g	150 g	150 g

Article number	6ES7145-4FF00-0AB0 ET200PRO, EM 4AO-U HF	6ES7145-4GF00-0AB0 ET200PRO, EM 4 AO-I HF
Product type designation		
Supply voltage		
Load voltage L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from backplane bus 3.3 V DC, max.	10 mA	10 mA
Address area		
Address space per module		
• Address space per module, max.	8 byte	8 byte
Analog outputs		
Number of analog outputs	4	4
Voltage output, short-circuit protection	Yes; per channel, electronic to chassis	Yes; per module, electronic to frame
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 V to 5 V	Yes	
• -10 V to +10 V	Yes	
Output ranges, current		
• 0 to 20 mA		Yes
• -20 mA to +20 mA		Yes
• 4 mA to 20 mA		Yes

I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

Analog expansion modules**Technical specifications** (continued)

Article number	6ES7145-4FF00-0AB0 ET200PRO, EM 4AO-U HF	6ES7145-4GF00-0AB0 ET200PRO, EM 4 AO-I HF
Connection of actuators		
• for voltage output two-wire connection	Yes	
• for voltage output four-wire connection	Yes	
• for current output two-wire connection		Yes
• for current output four-wire connection		Yes
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 000 ?	
• with voltage outputs, capacitive load, max.	1 µF	
• with current outputs, max.		600 ?
• 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
Cable length		
• shielded, max.	30 m	30 m
Analog value generation for the outputs		
Integration and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	15 bit; at -10 to +10 V; 14 bits at 1 to 5 V; 15 bits at 0 to 10 V	15 bit; at +/- 20 mA; 14 bits at 0 to 20 mA; 15 bits 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
Errors/accuracies		
Output ripple (based on output area, bandwidth 0 to 50 kHz), (+/-)	0.02 %	0.02 %
Linearity error (relative to output range), (+/-)	0.1 %	0.1 %
Temperature error (relative to output range), (+/-)	0.01 %/K	0.01 %/K
Repeat accuracy in steady state 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 %

Technical specifications (continued)

Article number	6ES7145-4FF00-0AB0 ET200PRO, EM 4AO-U HF	6ES7145-4GF00-0AB0 ET200PRO, EM 4 AO-I HF
Interrupts/diagnostics/status information		
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	No	No
Diagnostic messages		
• 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
Diagnostics indication LED		
• Group error SF (red)	Yes	Yes
Parameter		
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
Galvanic isolation		
Galvanic isolation analog outputs		
• between the channels	No	No
• between the channels and the backplane bus	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	130 mm	130 mm
Depth	35 mm	35 mm
Weights		
Weight, approx.	150 g	150 g

I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

Analog expansion modules

Ordering data	Article No.	Ordering data	Article No.
4AI U analog input module 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	6ES7144-4FF01-0AB0	4AO I analog output module High Feature, ± 20 mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7145-4GF00-0AB0
4AI I analog input module High Feature, ± 20 mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7144-4GF01-0AB0	Accessories CM IO 4 x M12 connection module 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	6ES7194-4CA00-0AA0
4AI RTD analog input module 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	6ES7144-4JF00-0AB0	M12 compensation connectors with integral PT100 for reference point compensation when connecting thermocouples	6ES7194-4AB00-0AA0
Analog input module 4AI TC 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	6ES7144-4PF00-0AB0	Module identification labels for color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	6ES7194-4HA00-0AA0
4AO U analog output module High Feature, ± 10 V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7145-4FF00-0AB0	M12 sealing cap for protection of unused M12 connections with ET 200pro	3RX9802-0AA00

Overview



Fail-safe digital inputs/outputs with IP65/66/67 degree of protection 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 SIL 3 (IEC 61508) and feature detailed diagnostics.

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

They can be used with IM151-7 F-CPU, CPU31xF-2 DP, CPU31xF-2 PN/DP and CPU416F-2.

Technical specifications

Article number	6ES7148-4FA00-0AB0 ET200PRO, EL-MOD., 8/16 F-DI 24V DC
Product type designation	
Supply voltage	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Digital inputs	
Number of digital inputs	16
Input voltage	
• Type of input voltage	DC
Input current	
• for signal "1", typ.	3.7 mA
Dimensions	
Width	90 mm
Height	130 mm
Depth	65 mm

Article number	6ES7148-4FC00-0AB0 ET200PRO, EL-MOD, 4/8 F-DI/4 F-DO 24VDC/2A	6ES7148-4FS00-0AB0 ET200PRO, EL-MOD, F-SWITCH PROFISAFE
Product type designation		
Supply voltage		
permissible range, lower limit (DC)	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V
Digital inputs		
Number of digital inputs	8	2
Digital outputs		
Number of digital outputs	4	3
short-circuit protection	Yes	Yes
Output current		
• for signal "1" rated value	2 A	
Dimensions		
Width	90 mm	45 mm
Height	130 mm	130 mm
Depth	65 mm	65 mm

I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

Fail-safe digital expansion modules

Ordering data	Article No.	Accessories	Article No.
Fail-safe digital input module 8/16 F-DI PROFIsafe 24 V DC, including bus module Connection module must be ordered separately	6ES7148-4FA00-0AB0	Connection module For the fail-safe electronic module F-switch PROFIsafe	6ES7194-4DA00-0AA0
Fail-safe digital input/output module 4/8 F-DI, 4 F-DO 2 A 24 V DC, including bus module Connection module must be ordered separately	6ES7148-4FC00-0AB0	Connection module For the fail-safe electronic module 4/8 F-DI/4 F DO, 24 V DC/2 A	6ES7194-4DC00-0AA0
Fail-safe electronic module F-Switch PROFIsafe 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 SIL3 (IEC 61508)	6ES7148-4FS00-0AB0	Connection module For the fail-safe electronic module 8/16 F-DI, 24 V DC	6ES7194-4DD00-0AA0
		PROFIBUS DP interface module IM154-2 Including termination module	6ES7154-2AA01-0AB0
		PROFINET interface module IM154-4 PN Including termination module	6ES7154-4AB10-0AB0
		M12 sealing cap For protection of unused M12 connections with ET 200pro	3RX9802-0AA00

Overview



- PM-E 24 V DC power module

Technical specifications

Article number	6ES7148-4CA00-0AA0 ET200PRO, PM-E 24V DC
Product type designation	
Supply voltage	
Rated value (DC)	24 V
Load voltage 2L+	
• short-circuit protection	Yes; via an exchangeable fuse in the power module
• Reverse polarity protection	Yes; against destruction
Current carrying capacity	
max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)
Interrupts/diagnostics/status information	
Diagnostic messages	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Missing load voltage	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Load voltage monitoring DC 24 V (green)	Yes

Article number	6ES7148-4CA00-0AA0 ET200PRO, PM-E 24V DC
Parameter	
Missing load voltage	Potential group of the power module
Isolation	
Isolation checked with	500 V DC
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP66	Yes
• IP67	Yes
Dimensions	
Width	15 mm
Height	81 mm
Depth	52 mm
Weights	
Weight, approx.	35 g

I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

PM-E power module

Ordering data	Article No.	Ordering data	Article 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.	6ES7148-4CA00-0AA0	PROFIBUS ECOFAST hybrid cable, GP Trailing-type cable with 4 x copper cores and 2 x copper cores, shielded, with UL approval <u>Unassembled</u> • 50 m • 100 m <u>Preassembled with ECOFAST male and female connector</u> • 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	6XV1860-4PN50 6XV1860-4PT10 6XV1860-3PH15 6XV1860-3PH30 6XV1860-3PH50 6XV1860-3PN10 6XV1860-3PN15 6XV1860-3PN20 6XV1860-3PN25 6XV1860-3PN30 6XV1860-3PN35 6XV1860-3PN40 6XV1860-3PN45 6XV1860-3PN50
Accessories CM PM-E ECOFAST connecting module For supplying 24 V load voltage, 1 ECOFAST Cu connection	6ES7194-4BA00-0AA0	ECOFAST cable connector, for user assembly Female connector; ordering unit 5 items	6GK1905-0CB00
CM PM-E direct connecting module For supplying 24 V load voltage, up to 2 M20 screwed cable glands	6ES7194-4BC00-0AA0	PROFIBUS ECOFAST hybrid plug, angled With 2 x shielded copper cores and 4 x 1.5 mm ² copper cores; 5 items; with assembly instructions; female insert	6GK1905-0CD00
CM PM-E 7/8" connecting module For supplying 24 V load voltage, 1 x 7/8"	6ES7194-4BD00-0AA0	Push-pull cable connector For 1L+/ 2L+, unassembled	6GK1907-0AB10-6AA0
CM PM-E PP connection module For supplying 24-V load voltage, 2 x push-pull, with spare fuse	6ES7194-4BE00-0AA0	Cover caps for push-pull female connectors 5 units	6ES7194-4JA50-0AA0
Spare fuse 12.5 A quick-response, for interface and power modules, 10 items per package unit	6ES7194-4HB00-0AA0	Accessories for CM PM-E direct Power line 5-core, 5 x 1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1,000 m	6XV1830-8AH10
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 ² in cross-section <u>Unassembled</u> • 50 m • 100 m <u>Preassembled with ECOFAST male and female connector, fixed length</u> • 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	6XV1830-7AN50 6XV1830-7AT10 6XV1830-7BH15 6XV1830-7BH30 6XV1830-7BH50 6XV1830-7BN10 6XV1830-7BN15 6XV1830-7BN20 6XV1830-7BN25 6XV1830-7BN30 6XV1830-7BN35 6XV1830-7BN40 6XV1830-7BN45 6XV1830-7BN50	Accessories for CM PM-E 7/8" 7/8" connecting cable to power supply 5-core, 5 x 1.5 mm ² , trailing type, preassembled 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	6XV1822-5BH15 6XV1822-5BH20 6XV1822-5BH30 6XV1822-5BH50 6XV1822-5BN10 6XV1822-5BN15
		7/8" cable connector With axial cable outlet • with female insert, 5 per pack	6GK1905-0FB00

Overview



PM-O 2 x 24 V DC power module with CM PM-O PP

- PM-O 2x 24 V DC power module

Technical specifications

Article number	6ES7148-4CA60-0AA0 ET200PRO, PM-O DC 2X24V
Product type designation	
Supply voltage	
Rated value (DC)	24 V
Load voltage 2L+	
• short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
Current carrying capacity	
max.	Output current 2 A for 1L+ and 6 A for 2L+
Interrupts/diagnostics/status information	
Diagnostic messages	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Fuse blown	No; Indirect diagnostics (short-circuit to M for 1L+), since electronic fuse
• Missing load voltage	No
Diagnostics indication LED	
• Rated load voltage PWR (green)	No
• Group error SF (red)	Yes
• Load voltage monitoring DC 24 V (green)	No; Signalled in IM or in PM

Article number	6ES7148-4CA60-0AA0 ET200PRO, PM-O DC 2X24V
Parameter	
Remark	Diagnosis short circuit implemented after M for 1L+
Galvanic isolation	
primary/secondary	No
Isolation	
Isolation checked with	500 V DC
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP66	Yes
• IP67	Yes
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	150 g

Ordering data

PM-O 2 x 24 VDC power module
For drawing the 24 V load voltage 2L+ and electronic/encoder supply voltage 1L+ within an ET 200pro station.

Article No.
6ES7148-4CA60-0AA0

Accessories

CM PM-O PP connection module
For drawing the 24 V load voltage and electronic/encoder supply voltage, 2 x push-pull connector

Article No.

6ES7194-4BH00-0AA0

Push-pull cable connector
For 1L+/ 2L+, unassembled

6GK1907-0AB10-6AA0

Cover caps for push-pull female connectors

5 units

6ES7194-4JA50-0AA0

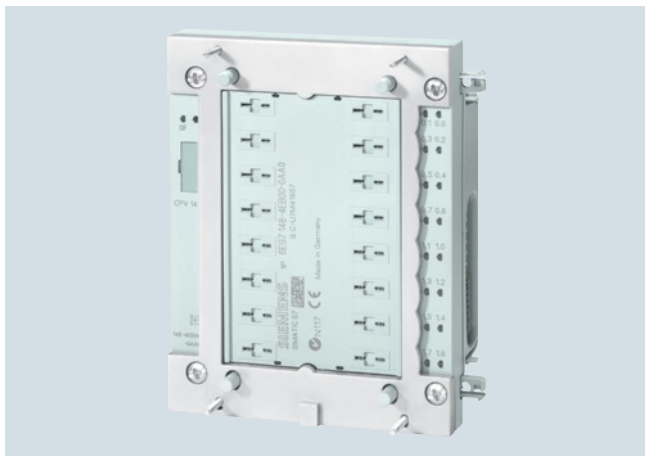
I/O systems

ET 200 systems without control cabinet

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

Article number	6ES7148-4EA00-0AA0	6ES7148-4EB00-0AA0
	ET200PRO, 16DO, PNEUMATIC INTERFACE CPV10	ET200PRO, 16DO, PNEUMATIC INTERFACE CPV14
Product type designation		
Supply voltage		
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• short-circuit protection	Yes	Yes
• Reverse polarity protection	Yes	Yes
Input current		
from load voltage 2L+ (without load), max.	20 mA	20 mA
from backplane bus 3.3 V DC, max.	25 mA	25 mA
Power losses		
Power loss, typ.	2.6 W	3.7 W
Address area		
Address space per module		
• without packing	2 byte	2 byte
Digital outputs		
Number of digital outputs	16	16
Load resistance range		
• lower limit	500 Ω	500 Ω
• upper limit	2 500 Ω	2 500 Ω
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)		
all mounting positions		
- 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

Technical specifications (continued)

Article number	6ES7148-4EA00-0AA0 ET200PRO, 16DO, PNEUMATIC INTERFACE CPV10	6ES7148-4EB00-0AA0 ET200PRO, 16DO, PNEUMATIC INTERFACE CPV14
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic functions	Yes	Yes
• Diagnostic information readable	Yes	Yes
Diagnostics indication LED		
• Group error SF (red)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
Pneumatics		
permissible working pressure, min.	3 bar	3 bar
permissible working pressure, max.	8 bar	8 bar
Rated flow rate	400 l/min	800 l/min
Number of connectable valves, max.	16	16
Parameter		
Remark	Diagnosis load voltage 2L+	Diagnosis load voltage 2L+
Behavior on CPU/Master STOP	No	
Galvanic isolation		
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
Permissible potential difference		
between different circuits	75V DC/60V AC	75V DC/60V AC
Isolation		
Isolation checked with	500 V DC	500 V DC
tested with		
• Load voltage L+ against backplane bus	500 V DC	500 V DC
Dimensions		
Width	90 mm	120 mm
Height	130 mm	152 mm
Depth	47 mm	47 mm

Ordering data
EM 148-P pneumatic interface

DO 16 x P/CPV 10 for direct accommodation of FESTO valve terminal CPV 10 16 DO x P

6ES7148-4EA00-0AA0

DO 16 x P/CPV 14 for direct accommodation of FESTO valve terminal CPV 14 16 DO x P

6ES7148-4EB00-0AA0
FESTO CPV10 valve terminal
Article No.

available from FESTO

FESTO CPV 14 valve terminal

available from FESTO

 FESTO AG & Co
 Rüterstr. 82
 D-73732 Esslingen

 More addresses
 on Internet at:
<http://www.festo.de>

I/O systems

ET 200 systems without control cabinet

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

Article No.	6GT2002-0HD00
Product-type designation	RF170C communication module
Suitability for installation	Distributed IO ET 200pro, in conjunction with RF200/300/600, MOBY D/E//U, MV
Transmission rate at point-to-point connection serial maximum	115.2 kbit/s
Interfaces	
Design of interface for point-to-point connection	RS422 via connection block
Number of readers connectable	2
Design of electrical connection	
• of the backplane bus	ET 200pro backplane bus
• of the PROFIBUS interface	(according to the head module)
• of the Industrial Ethernet Interface	(according to the head module)
• for supply voltage	ET 200pro backplane bus
Version of the interface to the reader for communication	Internal plug to the connection block
Mechanical data	
Material	Thermoplastic (Valox 467, fiberglass reinforced)
Color	IP Basic 714
Tightening torque of screw for mounting the equipment maximum	1.5 N·m
Supply voltage, current consumption, power loss	
Supply voltage for DC	
• rated value	24 V
• minimum	20 V
• maximum	30 V
Current consumed at 24 V DC	
• without connected devices typical	0.13 A
• including connected devices maximum	1 A
Permitted ambient conditions	
Ambient temperature	
• during operating	-25 ... +55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C

Article No.	6GT2002-0HD00
Product-type designation	RF170C communication module
Protection class IP	IP 67
Resistance against shock	According to IEC 61131-2
Resistance against shock	300 m/s ²
Resistance against vibration	100 m/s ²
Design, dimensions and weight	
Width	90 mm
Height	130 mm
Depth	35 mm
Net weight	0.27 kg
Mounting type	ET 200pro rack
Cable length for RS 422 interface maximum	1000 m
Product properties, functions, components general	
Type of display	(see connection block)
Product function transponder file handler can be addressed	No
Protocol is supported S7 communication	Yes
Product functions management, configuration	
Type of parameterization	HSP
Type of programming	FB 45, FB 55 (FC 45/55 with limited functionality)
Type of computer-mediated communication	acyclic communication
Standards, specifications, approvals	
Verification of suitability	CE, FCC, cULus
Accessories	
Accessories	Connection block for RF170C

Technical specifications (continued)

Article No.	6GT2002-1HD00
Product-type designation	Connection block for RF170C
Suitability for installation	Connection block for RF170C
Interfaces	
Design of interface for point-to-point connection	RS422
Number of readers connectable	2
Mechanical data	
Material	Die-cast zinc
Color	Silver
Tightening torque of screw for mounting the equipment maximum	1.5 N·m
Supply voltage, current consumption, power loss	
Supply voltage for DC rated value	24 V
Supply voltage • for DC	20 ... 30 V
Permitted ambient conditions	
Ambient temperature	
• during operating	-25 ... +55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Protection class IP	IP 67
Resistance against shock	According to IEC 61131-2
Resistance against shock	300 m/s ²
Resistance against vibration	100 m/s ²
Design, dimensions and weight	
Width	90 mm
Height	130 mm
Depth	25 mm
Net weight	0.5 kg
Mounting type	4 screws included
Product properties, functions, components general	
Type of display	4 LEDs per reader connection, 1 LEDs for device status

Ordering data**Article No.**

SIMATIC RF170C communication module	6GT2002-0HD00
For connecting to the distributed I/O system ET 200pro	
Accessories	
Connection block for SIMATIC RF170C	6GT2002-1HD00
For connecting 2 readers via an M12 connector	
Reader cables for SIMATIC RF200 / RF300 / RF600 / MV400	
Or extension cable MOBY D and SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, CMG approved, suitable for cable carriers, straight connector	
2 m	6GT2891-4FH20
5 m	6GT2891-4FH50
10 m	6GT2891-4FN10
20 m	6GT2891-4FN20
50 m	6GT2891-4FN50
2 m, plug angled at reader	6GT2891-4JH20
5 m, plug angled at reader	6GT2891-4JH50
10 m, plug angled at reader	6GT2891-4JN10
Reader cable for MOBY D	6GT2691-4FH20
PUR material, CMG approved, suitable for cable carriers, 2 m	
M12 sealing caps for unused reader connections	3RX9802-0AA00
10 units minimum order quantity, price per 100 units	
DVD "RFID Systems Software & Documentation"	6GT2080-2AA20

I/O systems

ET 200 systems without control cabinet

ET 200pro – Power supplies

3-phase, 24 V DC (ET 200pro PS, IP67)

Overview



Power supply for ET200pro:

- 3-phase, 24 V DC/8 A

The SIMATIC ET 200pro PS power supply unit with degree of protection IP67 is used as the electronics/encoder supply and load voltage supply of the new SIMATIC ET 200pro distributed I/O system for use close to the machine without a cabinet. With a signaling contact for "24 V OK" and "Overtemperature", as well as a second plug-in connector for input voltage loop-through.

Technical specifications

Article number	6ES7148-4PC00-0HA0
Product	SIMATIC ET 200pro PS
Power supply, type	24 V/8 A
Input	
Input	3-phase AC
Rated voltage value V_{in} rated	400 ... 480 V
Voltage range AC	340 ... 550 V
• Note	320 ... 340 V for max. 1 min
Wide-range input	Yes
Overvoltage resistance	Implemented internally with varistors
Mains buffering at I_{out} rated, min.	15 ms; at $V_{in} = 400$ V
Rated line frequency	50 ... 60 Hz
Rated line range	45 ... 66 Hz
Input current	
• at rated input voltage 400 V	0.5 A
Switch-on current limiting (+25 °C), max.	40 A
I^2t , max.	3.5 A ² ·s
Built-in incoming fuse	T 4 A
Protection in the mains power input (IEC 898)	Required: Circuit breaker 3RV2011-1DA10 or 3RV2711-1DD10 (UL 489)

Article number	6ES7148-4PC00-0HA0
Product	SIMATIC ET 200pro PS
Power supply, type	24 V/8 A
Output	
Output	Controlled, isolated DC voltage
Rated voltage V_{out} DC	24 V
Total tolerance, static ±	3 %
Static mains compensation, approx.	0.5 %
Static load balancing, approx.	0.5 %
Residual ripple peak-peak, max.	200 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	250 mV
Product function 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 V_{out} 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 $V_{out} < 2$ %
Startup delay, max.	1.5 s
Voltage rise, typ.	40 ms
Rated current value I_{out} rated	8 A
Current range	0 ... 8 A
Active power supplied typical	192 W
Short-term overload current	
• on short-circuiting during the start-up typical	50 A
• at short-circuit during operation typical	50 A
Duration of overloading capability for excess current	
• on short-circuiting during the start-up	100 ms
• at short-circuit during operation	100 ms
Parallel switching for enhanced performance	No

Technical specifications (continued)

Article number	6ES7148-4PC00-0HA0
Product	SIMATIC ET 200pro PS
Power supply, type	24 V/8 A
Efficiency	
Efficiency at V_{out} rated, I_{out} rated, approx.	88 %
Power loss at V_{out} rated, I_{out} rated, approx.	25 W
Closed-loop control	
Dynamic mains compensation (V_{in} rated ± 15 %), max.	0.5 %
Dynamic load smoothing (I_{out} : 50/100/50 %), $U_{out} \pm$ typ.	1 %
Setting time maximum	2 ms
Protection and monitoring	
Output overvoltage protection	< 33 V
Current limitation, typ.	9.4 A
Property of the output	Yes
Short-circuit proof	Yes
Short-circuit protection	Electronic shutdown, automatic restart
Enduring short circuit current RMS value	
• maximum	10 A
Overload/short-circuit indicator	-
Safety	
Primary/secondary isolation	Yes
Galvanic isolation	Protective extra low output voltage V_{out} according to EN 60950-1 and EN 50178
Protection class	Class I
Leakage current	
• maximum	3.5 mA
• typical	0.4 mA
CE mark	Yes
UL/CSA approval	Yes
UL/cUL (CSA) approval	UL-Listed (UL 508) according to NFPA compatibility (National Fire Protection Association), see operating instructions
Explosion protection	No
Certificate of suitability IECEx	No
Certificate of suitability NEC Class 2	No
FM approval	-
CB approval	Yes
Marine approval	No
Degree of protection (EN 60529)	IP67, enclosure type 4 indoor

Article number	6ES7148-4PC00-0HA0
Product	SIMATIC ET 200pro PS
Power supply, type	24 V/8 A
EMC	
Emitted interference	EN 55022 Class A
Supply harmonics limitation	-
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature	
• during operation	-25 ... +55 °C
- Note	with natural convection
• during transport	-40 ... +70 °C
• during storage	-40 ... +70 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation
Mechanics	
Connection technology	screw-type terminals
Connections	
• Supply input	L1, L2, L3, PE: Plug connector HAN Q4/2 (counterpart see "Electrical accessories")
• Output	L+, M: 2 x 1.5 mm ² each (4-pole cable for +/- with open, labeled ends, 4 x 1.5 mm ²)
• Auxiliary	Alarm signals: M12 plug-in connector 5-pin
Width of the enclosure	310 mm
Height of the enclosure	135 mm
Depth of the enclosure	90 mm
Weight, approx.	2.8 kg
Product property of the enclosure housing for side-by-side mounting	No
Installation	Can be mounted onto ET200pro mounting rail
Electrical accessories	Power connector (Input: 3RK1911-2BE30 (6 mm ²)) (Output: 3RK1911-2BF10 (4 mm ²))
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

SIMATIC ET 200pro PS

Stabilized power supply in distributed I/O system design, permitting the loop-through of energy to further modules; with degree of protection IP67;
Input: 400-480 V 3 AC
Output: 24 V DC/8 A

Article No.

6ES7148-4PC00-0HA0

Article No.

Accessories

Power connector

For connecting to the distributed I/O system

- For X1 (6 mm²)
- For X2 (6 mm²)

3RK1911-2BE30
3RK1911-2BF10

Sealing cap

For 9-pin power sockets

- X2 (1 unit)
- X2 (10 units)

3RK1902-0CJ0
3RK1902-0CK00

I/O systems

ET 200 systems without control cabinet
ET 200 pro - ET 200pro motor starters

General data

Overview

ET 200pro motor starters in the ET 200pro I/O system

SIMATIC ET 200pro is a modular I/O system in the degree of protection IP65/66/67 for machine-level, cabinet-free use. ET 200pro motor starters in the high degree of protection IP65 are an integral part of ET 200pro.



ET 200pro motor starter: Isolator module, Standard starter and High Feature starter mounted on a wide module rack

ET 200pro motor starters

- Only two versions up to 5.5 kW
- All settings can be parameterized by bus
- Comprehensive diagnostics signals
- PROFlenergy support
- 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
- Full support of acyclic services
- Direct-on-line or reversing starters
- Power bus connection can be plugged in using Han Q4/2 plug-in connectors
- Motor feeder with Han Q8/0 connector
- Conductor cross-sections up to 6 x 4 mm²
- 25 A per segment (power looped through using jumper plug)
- In the Standard and High Feature versions (with 4 DI on board)
- Electromechanical switching and electronic switching
- Electronic starter for direct activation or with integrated soft starter function
- Supplied with 400 V AC brake contact as an option
- Provision of the motor current in PROFlenergy format to higher-level systems, motor current shutdown in dead times using PROFlenergy

ET 200pro isolator modules (see page 9/393)

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 downstream supplied motor starters).

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

Safety applications

[Safety Solution local](#) (see page 9/394)

With the Safety local modules

- Safety local isolator module and

- 400 V disconnecting module
it is possible to achieve safety level SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) with an appropriate connection.

[Safety Solution PROFIsafe](#) (see page 9/397)

With the Safety PROFIsafe modules

- F-Switch and
- 400 V disconnecting module
it is likewise possible to achieve safety level SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1).

Functionality

With the ET 200pro motor starters, any AC loads can be protected and switched.

The ET 200pro motor starters are available with both mechanical and electronic contacts.

The ET 200pro electromechanical starters are offered as direct-on-line (DSe) and reversing starters (RSe) in the versions **Standard** and **High Feature**. There are device versions with or without control for externally fed brakes with 400 V AC.

Compared to the Standard motor starter, the **High Feature mechanical motor starter** also has:

- 4 digital inputs
- Advanced parameterization options

The ET 200pro electronic starters are offered as direct-on-line starters (sDSSSt/sDSt) and reversing starters (sRSSSt/sRSt) in the High Feature version.

Compared to the High Feature mechanical motor starter, the **High Feature electronic motor starter** also has:

- Soft starting and smooth ramp-down function
- Deactivated soft start function as an electronic starter for applications with a high switching frequency
- Advanced parameterization options

As a result of the protection concept with electronic 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 particularly felt particularly in manufacturing processes with high plant downtime costs:

- Configuration is made easier and flexibility enhanced by the fine modular structure with ET 200pro. When using the ET 200pro motor starters, the parts list per load feeder is reduced to 2 main items: the bus module and the motor starter. This makes the ET 200pro ideal for modular machine concepts or solutions for conveyor systems and in machine-tool construction.
- 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.

Type	Standard motor starters		High Feature motor starters	
	DSe, RSe		DSe, RSe	sDSSSte, sDSte, sRSSSte, sRSte
Technology designation ¹⁾				
Device functions (firmware features)				
Parameterizable rated operational current		✓		
Integrated short-circuit protection		✓		
Parameterizable current limit values	--		✓ 2 limit values	
Parameterizable response in case of current limit violation		--	✓	
Zero current monitoring		✓		
Parameterizable response in case of zero current violation		✓		
Parameterizable current unbalance limit	%	-- fixed limit value (30 x I _e)	✓ 30 ... 60 x I _e	
Parameterizable response in case of unbalance limit violation		✓		
Motor blocking monitoring		--	✓	
Parameterizable blocking current limit	%	--	✓ 150 ... 1 000 x I _e	
Parameterizable blocking time limit	s	--	✓ 1 ... 5	
Current value transmission		✓		
Group warning diagnostics		--	✓ parameterizable	
Group diagnostics		✓ parameterizable		
Emergency start		✓		
Digital inputs		--	✓ 4 inputs	
• Parameterizable input signal		--	✓ latching/non-latching	
• Parameterizable input level		--	✓ NC/NO	
• Parameterizable input signal delay	ms	--	✓ 10 ... 80	
• Parameterizable input signal extension	ms	--	✓ 0 ... 200	
• Parameterizable input control actions		--	✓ 12 different actions	
Brake output (400 V AC)		✓ order option		
Parameterizable brake enabling delay	s	✓ -2.5 ... 2.5		
Parameterizable holding time of the brake during stopping	s	✓ 0 ... 25		
Parameterizable start up type		--		✓
Parameterizable ramp-down time		--		✓
Parameterizable starting voltage		--		✓
Parameterizable stopping voltage		--		✓
Local device interface		✓		
Firmware update		✓ by specialists		
Thermal motor model		✓		
Parameterizable trip class		-- CLASS 10 fixed	✓ CLASS 5, 10, 15, 20	
Parameterizable response in case of overload of thermal motor model		--	✓ 3 possible states	
Advance warning limit for motor heating	%	--	✓ parameterizable 0 ... 95	
Advance warning limit time-related trip reserve	s	--	✓ parameterizable 0 ... 500	
Parameterizable recovery time	min	--	✓ 1 ... 30	
Parameterizable protection against voltage failure		-- permanently integrated	✓	
Reversing start function		✓ order option		
Parameterizable interlock time for reversing starters		-- 150 ms fixed	✓ 0 ... 60 s	
Integrated logbook functions		✓ 3 device logbooks		
Integrated statistics data memory		✓		
Parameterizable response in case of CPU/master stop		✓		
PROFenergy profile support		✓		
• Disconnection of the motor current during idle times		✓		
• Measured motor current values		✓		
Device indications				
• Group fault		SF LED (red)		
• Switching state		STATE LED (red, yellow, green)		
• Device status		DEVICE LED (red, yellow, green)		
• Digital inputs		--	IN 1 ... IN 4, LED	

✓ Function available

-- Function not available

- ¹⁾ DS direct-on-line starter
RS reversing starter
DSS .. direct soft starter
RSS .. reversing soft starter
e electronic motor protection
te full motor protection (thermal + electronic)
s electronic switching with semiconductor.

I/O systems

ET 200 systems without control cabinet

ET 200 pro - ET 200pro motor starters

General data

Technical specifications

Type	Standard motor starters		High Feature motor starters	
	Mechanically switching without inputs		Mechanically switching with inputs	Mechanically switching with inputs and soft starter function
Technology designation ¹⁾	DSe, RSe		DSe, RSe	sDSSSte, sDSte, sRSSSte, sRSte
Mechanics and environment				
Motor starters or modules that can be connected to ET 200pro With width of 110 mm	max. 8			
Mounting dimensions (W x H x D) • Direct-on-line starters and reversing starters	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 position	Vertical, horizontal			
Vibration resistance acc. to IEC 60068, parts 2-6	g	2		
Shock resistance acc. to IEC 60068, parts 2-27	g/ms	Half-sine 15/11		
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) • From auxiliary circuit A1/A2 (U2)	mA mA	Approx. 40 Approx. 200		
Rated operational current I_e for power bus	A	25		
Rated operational voltage U_e • Approval according to EN 60947-1, Appendix N • Approval according to CSA and UL	V AC V AC V AC	400 (50/60 Hz) Up to 400 (50/60 Hz) Up to 600 (50/60 Hz)		Up to 400 (50/60 Hz) Up to 480 (50/60 Hz)
Approval • DIN VDE 0106, Part 101 • CSA and UL approval	V V	Up to 400 Up to 600		Up to 480 Up to 480
Conductor cross-sections • Incoming energy supply	mm ²	max. 6 x 4		
Touch protection	Finger-safe			
Rated impulse withstand voltage U_{imp}	kV	6		
Rated insulation voltage U_i	V	400		
Rated operational current I_e for starters • AC-1/2/3 at 40 °C - At 400 V - At 500 V • AC-4 at 40 °C - At 400 V	A A A	0.15 ... 2.0/1.5 ... 12.0 0.15 ... 2.0/1.5 ... 9.0 0.15 ... 2.0/1.5 ... 4.0		0.15 ... 2.0/1.5 ... 12.0 ²⁾
Rated short-circuit breaking capacity	kA	100 at 400 V		
Type of coordination acc. to IEC 60947-4-1	1			
Power of three-phase motors at 400 V	kW	max. 5.5		Max. 5.5/4 ³⁾
Utilization categories	AC-1, AC-2, AC-3, AC-4			AC-53a ⁴⁾ (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 • Electrical	Operating cycles Operating cycles	30 million Up to 10 million; depending on the current loading (see manual ⁵⁾)		-- --
Permissible switching frequency	Depending on the current load, motor starting time, and relative ON period (see manual ⁵⁾)			
Operating times for 0.85 ... 1.1 x U_e • Closing delay • Opening delay	ms ms	11 ... 50 5 ... 45		-- --

1) DS direct-on-line starter
RS reversing starter
DSS .. direct soft starter
RSS .. reversing soft starter
e electronic motor protection
te full motor protection (thermal + electronic)
s electronic switching with semiconductor.

2) Note:
If the soft starter control function is deactivated, the permissible rated operational current is reduced to 9 A up to CLASS 10.

3) With parameterization as electronic starter max. 4 kW.

4) 8-hour operation.

5) <http://support.automation.siemens.com/WW/view/en/22332388>

More information

Notes on safety

System networking requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation.

More information on the subject of Industrial Security, see www.siemens.com/industrialsecurity.

Overview

The functionality, device functions, and technical specifications of the Standard motor starter are described in "ET 200pro Motor Starters, General Data" (see from page 9/388).

Selection and ordering data

Version

Article No.

Standard motor starters, mechanical
Motor protection: thermal model

DSe Standard

DSe direct-on-line starters¹⁾

- Without brake output
- With brake output 400 V AC

3RK1304-5□S40-4AA0
3RK1304-5□S40-4AA3

RSe reversing starters¹⁾

- Without brake output
- With brake output 400 V AC

3RK1304-5□S40-5AA0
3RK1304-5□S40-5AA3

Setting range
Rated operational current

- 0.15 ... 2.0 A
- 1.5 ... 12.0 A

K
L

¹⁾ 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 ET 200pro motor starters" on page 9/398).

I/O systems

ET 200 systems without control cabinet

ET 200 pro - ET 200pro motor starters

High Feature motor starters

Overview

The functionality, device functions, and technical specifications of the High Feature motor starter are described in "ET 200pro Motor Starters, General Data" (see from page 9/388).

The High Feature motor starter differs from the Standard motor starter in having more parameters and four integrated, freely-parameterizable digital inputs.

Selection and ordering data

Version

Article No.

High Feature motor starters, mechanical Motor protection: thermal model



RSe High Feature

DSe direct-on-line starters¹⁾

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

3RK1304-5□S40-2AA0
3RK1304-5□S40-2AA3

RSe reversing starters¹⁾

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

3RK1304-5□S40-3AA0
3RK1304-5□S40-3AA3

Setting range
Rated operational current

- 0.15 ... 2.0 A
- 1.5 ... 12.0 A

K
L

High Feature motor starters²⁾, electronic Full motor protection, comprising thermal motor protection and thermistor motor protection



sRSSte High Feature

sDSSte/sDSte direct-on-line starters¹⁾²⁾

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

3RK1304-5□S70-2AA0
3RK1304-5□S70-2AA3

sRSSte/sRSte reversing starters¹⁾²⁾

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

3RK1304-5□S70-3AA0
3RK1304-5□S70-3AA3

Setting range
Rated operational current

- 0.15 ... 2.0 A
- 1.5 ... 12.0 A

K
L

¹⁾ 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 ET 200pro Motor Starters" on page 9/398).

²⁾ The solid-state motor starters can be used not only as solid-state motor starters with a high level of switching frequency but also as fully fledged soft starters for soft starting and stopping. 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 motor starter: 0.15 to 2 A and 1.5 to 9 A (4 kW)
- Parameterization as soft starter: 0.15 to 2 A and 1.5 to 12 A (5.5 kW).

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 following properties apply to the isolator module:

- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Cabinet-free design thanks to high degree of protection IP65

The isolator module is also available in a safety version (see page 9/394 "Safety local Isolator Modules").

Technical specifications

Type	Isolator modules	
General data		
Mounting dimensions (W x H x D)		
• Direct-on-line starters and reversing starters	mm	110 x 230 x 170
Permissible ambient temperature		
• During operation	°C	-25 ... +55
• During storage	°C	-40 ... +70
Permissible mounting position		any
Vibration resistance acc. to IEC 60068 Part 2-6	g	2
Shock resistance acc. to IEC 60068, parts 2-27	g/ms	Half-sine 15/11
Current consumption		
• From auxiliary circuit L+/M (U1)	mA	Approx. 20
• From auxiliary circuit A1/A2 (U2)		--
Rated operational current I_e for power bus	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 ²	max. 6 x 4

Type	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 I_e for starters		
• 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, acc. to DIN VDE 0106 Part 101
Device functions		
• Group diagnostics		Yes, parameterizable
Device indications		
• Group fault		SF LED (red)

Selection and ordering data

Version

Article No.

ET 200pro isolator module, mechanical

Isolator module¹⁾
Rated operational current 25 A

3RK1304-0HS00-6AA0

3RK1304-0HS00-6AA0

¹⁾ Only functions when used together with the corresponding 110 mm backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see page 9/398, "Accessories for ET 200pro Motor Starters").

I/O systems

ET 200 systems without control cabinet

ET 200 pro - ET 200pro Safety motor starters Solutions local/PROFIsafe

Safety modules local

Overview

Safety Solution local

With the Safety local modules

- Safety local isolator module and
- 400 V disconnecting module

it is possible to achieve safety level SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) with an appropriate connection.



ET 200pro motor starters (Safety Solution local): 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 SIL 3/PL e (protective door or EMERGENCY STOP pushbuttons) and parameterizable start behavior
- For controlling 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 SIL 3/PL e. 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.

Functionality

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 3TK2841 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 separates the 400 V circuit up to SIL 3/PL e.

In combination with the 400 V disconnecting module, the Safety local isolator module can be used for safety applications up to SIL 3/PL e.

400 V disconnecting module

The 400V disconnecting module can be used together with the Safety local isolator module for local safety applications and together with the F-Switch for PROFIsafe safety applications.

It contains two contactors connected in series for safety-related disconnection of the main circuit.

The auxiliary circuit supply of the device is over a safety power rail in the backplane bus module.

The 400 V disconnecting module can be used in conjunction with the Safety local isolator module or with the F-Switch for safety applications up to SIL 3/PL e.

Technical specifications



Type		Safety local isolator module	400 V disconnecting module
General data			
Mounting dimensions (W x H x D) in mm			
• Direct-on-line starters and reversing starters	mm	110 x 230 x 170	110 x 230 x 150
Permissible ambient temperature			
• During operation	°C	-25 ... +55	
• During storage	°C	-40 ... +70	
Permissible mounting position		any	
Vibration resistance acc. to IEC 60068, parts 2-6		2 g	
Shock resistance acc. to IEC 60068, parts 2-27		Half-wave 15 g/11 ms	
Current consumption			
• From auxiliary circuit L+/M (U1)	mA	Approx. 20	
• From auxiliary circuit A1/A2 (U2)		--	
Rated operational current I_e for power bus	A	25	
Rated operational voltage U_e	V	400 (50/60 Hz)	
Approval DIN VDE 0106, part 101	V	Up to 500	
CSA and UL approval	V	Up to 600	
Conductor cross-sections			
Incoming energy supply	mm ²	max. 6 x 4	
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 I_e for starters			
• 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 DIN VDE 0106 Part 101	
Operating times for 0.85 ... 1.1 x U_e			
• Closing delay	ms	--	25 ... 100
• Opening delay	ms	--	7 ... 10
Device functions			
• Group diagnostics		Yes, parameterizable	
Device indications			
• Group fault		SF LED (red)	

I/O systems

ET 200 systems without control cabinet

ET 200 pro - ET 200pro Safety motor starters Solutions local/PROFIsafe

Safety modules local**Selection and ordering data**

Version	Article No.
Safety modules local	
 <p>Safety local isolator modules¹⁾²⁾ Rated operational current 16 A</p> <p>3RK1304-OHS00-7AA0</p>	3RK1304-OHS00-7AA0
 <p>400 V disconnecting modules³⁾⁴⁾ Rated operational current 25 A</p> <p>3RK1304-OHS00-8AA0</p>	3RK1304-OHS00-8AA0

1) The Safety local isolator module only functions when used together with the 400 V disconnecting module.

2) Only in combination with the special backplane bus module for the Safety local isolator module (see page 9/402, "Accessories for ET 200pro Motor Starters").

3) The 400 V disconnecting module functions only when used together with the Safety local isolator module or with the F-Switch.

4) The 400 V disconnecting module functions only 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 page 9/402, "Accessories for ET 200pro Motor Starters").

Overview**Safety Solution PROFIsafe**

With the Safety PROFIsafe modules

- F-Switch and
- 400 V disconnecting module

it is possible to achieve safety level SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) with an appropriate connection.

F-Switch PROFIsafe

Fail-safe digital inputs/outputs in degrees of protection IP65 to IP67 for machine-level, 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 busbars

The F-Switch is certified up to SIL 3/PL e and has detailed diagnostics.

It supports PROFIsafe in PROFIBUS configurations as well as in PROFINET configurations.

Note:

Safety characteristics see [Catalog IC 10 ·2015, Chapter 16 "Appendix" → "Standards and Approvals" → "Overview"](#).



400 V disconnecting module

See "Safety modules local", Overview page 9/394 and Technical specifications page 9/395.

Functionality

The PROFIsafe F-Switch is a fail-safe electronic module for PROFIsafe safety applications. It has two fail-safe inputs and outputs for safe switching of the 24 V supply over backplane busbars. In combination with the 400 V disconnecting module, the fail-safe disconnection of ET 200pro motor starters is possible in PROFIsafe applications up to SIL 3/PL e.

Selection and ordering data

Version	Article No.
ET 200pro safety modules	
 3RK1304-0HS00-8AA0	400 V disconnecting modules¹⁾²⁾ Rated operational current 25 A 3RK1304-0HS00-8AA0
 6ES7148-4FS00-0AB0	F-Switch PROFIsafe 24 V DC, including bus module Connection module must be ordered separately 6ES7148-4FS00-0AB0
	Connection modules for F-Switch 24 V DC 6ES7194-4DA00-0AA0

- ¹⁾ The 400 V disconnecting module functions only when used together with the Safety local isolator module or with the F-Switch.
- ²⁾ The 400 V disconnecting module functions only 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 page 9/402, "Accessories for ET 200pro Motor Starters").

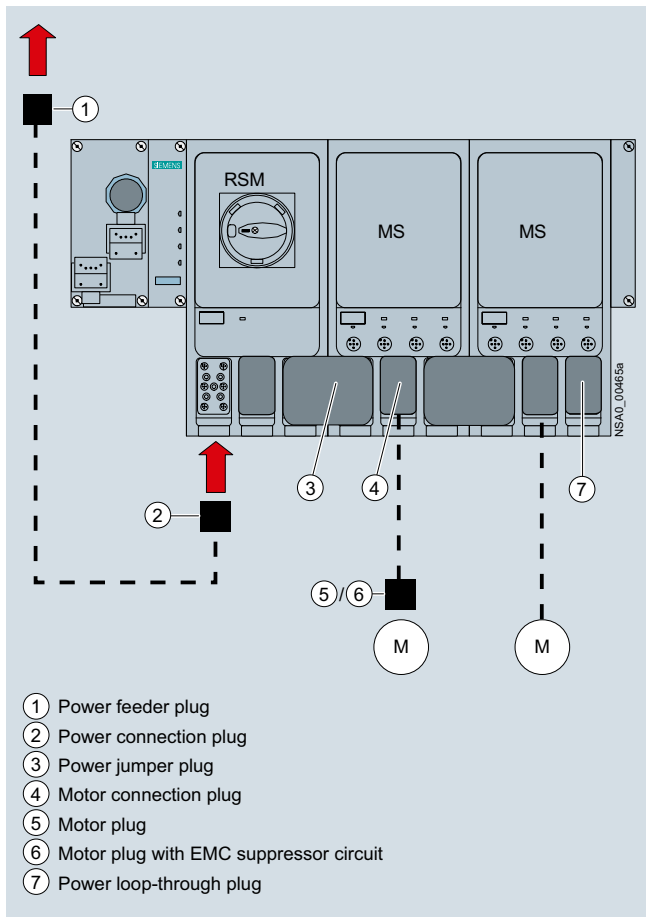
I/O systems

ET 200 systems without control cabinet

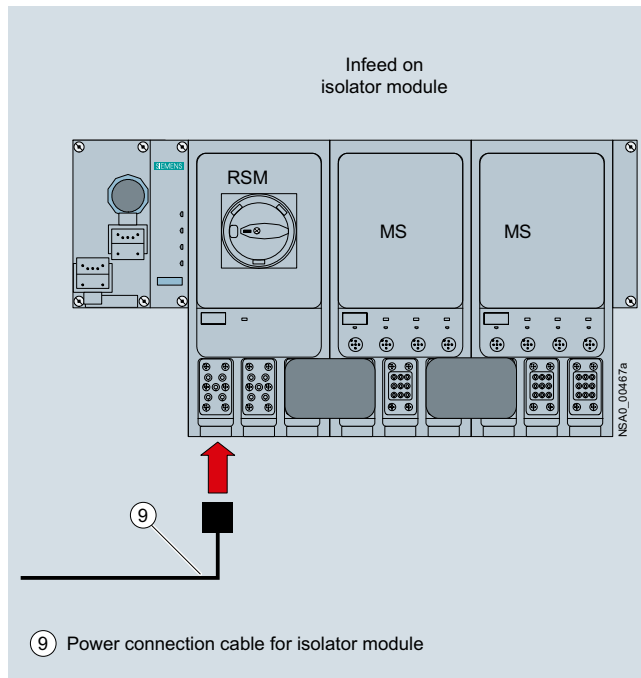
ET 200 pro - ET 200pro Safety motor starters Solutions local/PROFIsafe

Accessories for ET 200pro motor starters

Overview



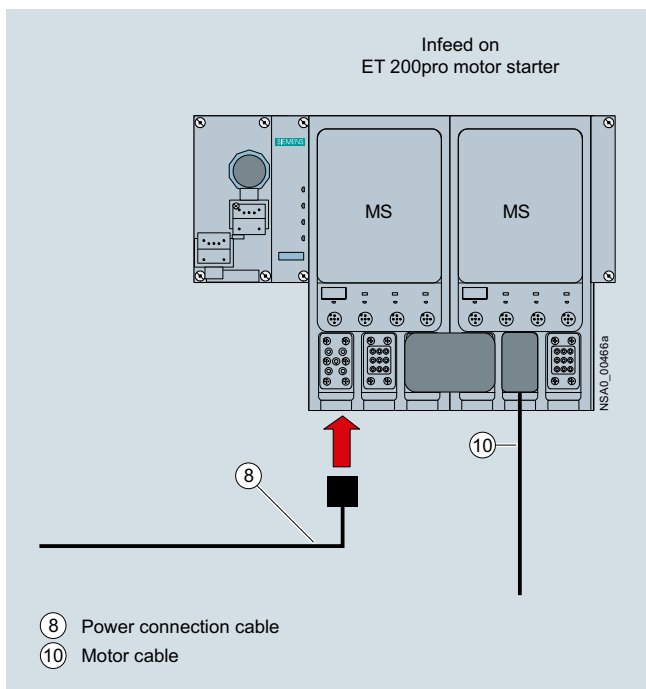
Basic design of an ET 200pro version with (from the left) connection module for IM, interface module for communication (IM), RSM isolator module, two ET 200pro motor starters (MS), and connections for power



Infeed on the RSM isolator module

Legend:

- ① Power feeder plug (see page 9/400)
- ② Power connection plug (see page 9/400)
- ③ Power jumper plug (see page 9/400)
- ④ Motor connection plug (see page 9/400)
- ⑤ Motor plug (see page 9/400)
- ⑥ Motor plug with EMC suppressor circuit (see page 9/400)
- ⑦ Power loop-through plug (see page 9/400)
- ⑧ Power connection cable (see page 9/400)
- ⑨ Power connection cable for isolator modules (see page 9/400)
- ⑩ Motor cable (see page 9/401)



Infeed on the ET 200pro motor starter

Power bus

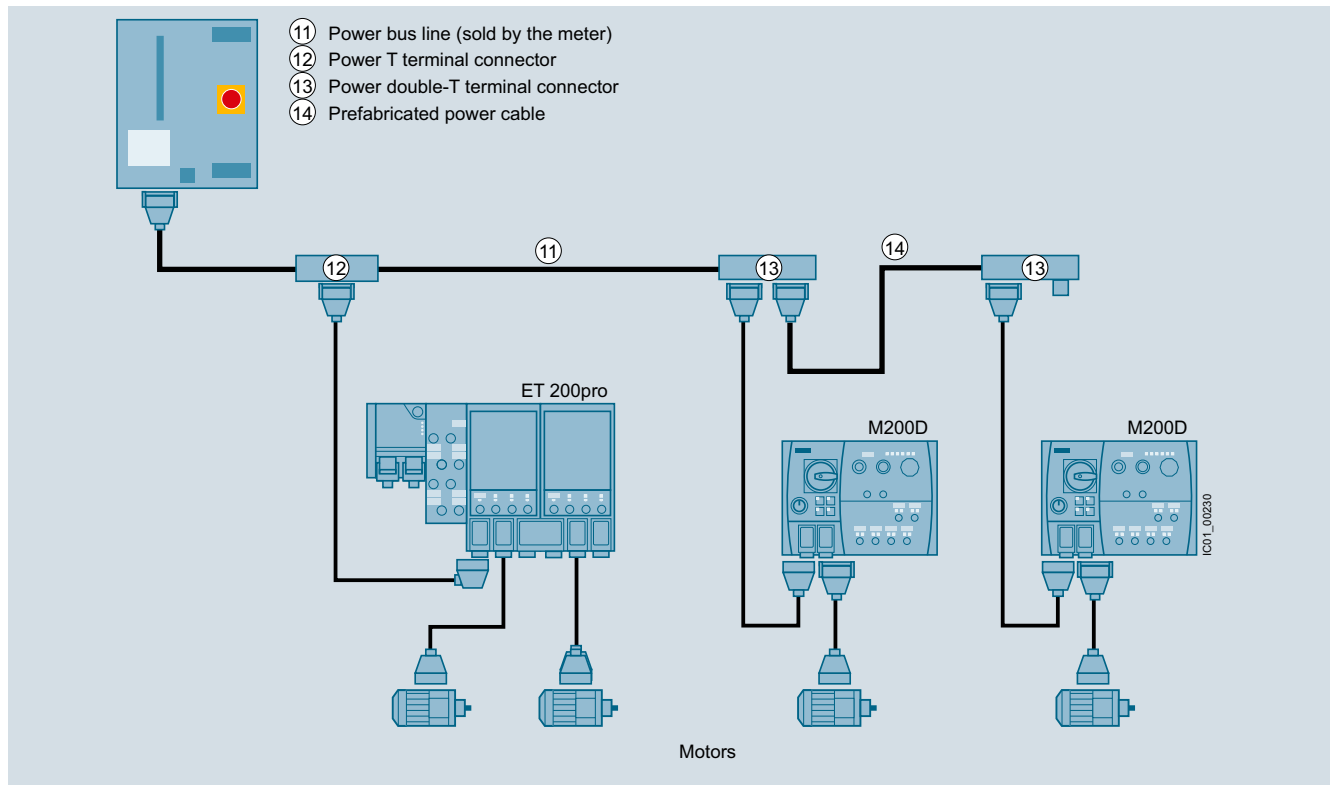
The power supply to the field devices (ET 200pro motor starters, M200D motor starters) is provided via the power bus, in which the power T terminal connectors or power double-T terminal connectors are connected by power bus cables.

Feeders

From the terminal connectors, spur lines with Han Q4/2 plugs lead to the field devices, from which the motors are supplied with power via motor connection cables.

Interruption-free thanks to power terminal connectors

In finger-safe connection technology the power T terminal connectors and power double-T terminal connectors connect the components of a feeder to the power bus. They ensure interruption-free operation, i.e. when the components are plugged in, the power bus is not interrupted.



Power supply to the motors via the power bus with power T and double-T terminal connectors linked by power bus cables, spur lines to the field devices (motor starters), and power loop-through connections to the motors via motor connection cables

Motor control via PROFIBUS

The interface modules (IM) for PROFIBUS can be combined with three different connection modules for connecting PROFIBUS DP and the power supply:

- Direct connection with cable glands
- ECOFAST connection with hybrid fieldbus cables (with two copper cores for data transmission with PROFIBUS DP, and four copper cores for the power supply), and ECOFAST connectors (HanBrid)¹⁾
- M12, 7/8" connection
 - with M12 connecting cable and M12 plugs for data transmission with PROFIBUS DP
 - with 7/8" connecting cable and 7/8" plugs for the power supply²⁾

The connection modules with the relevant accessories can be found among the accessories for the ET 200pro interface modules IM 154-1 and IM 154-2 (see page 9/350).

¹⁾ Hybrid fieldbus connections with HanBrid sockets designed as cabinet bushings transmit data and energy from the control cabinet (IP20) to the field (IP65). They are the interface for jointly routing PROFIBUS DP and the auxiliary voltages into the hybrid fieldbus cable.

²⁾ On the control cabinet bushings with two M12 sockets for the PROFIBUS M12 connecting cables, the 24 V supply of the motor starters is implemented via separate 7/8" connecting cables.

Motor control via PROFINET

The connection modules with the relevant accessories can be found among the accessories for the ET 200pro interface module IM 154-4 PN (see page 9/354).

Motor control via Industrial Wireless LAN

As well as wired solutions, communication can also be made via Industrial Wireless LAN (see interface module IM 154-6 PN IWLAN, page 9/357).

I/O systems



ET 200 systems without control cabinet

ET 200 pro - ET 200pro Safety motor starters Solutions local/PROFIsafe

Accessories for ET 200pro motor starters

Selection and ordering data

Version	Article No.
Incoming energy supply	
<p>① Power feeder plugs 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</p> <ul style="list-style-type: none"> • 5 male contacts 2.5 mm² • 5 male contacts 4 mm² • 5 male contacts 6 mm² 	<p>3RK1911-2BS60 3RK1911-2BS20 3RK1911-2BS40</p>
<p>② Power connection plugs Connector set for energy supply for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angular outgoing feeder, female insert for HAN Q4/2, incl. gland</p> <ul style="list-style-type: none"> • 5 female contacts 2.5 mm² • 5 female contacts 4 mm² • 5 female contacts 6 mm² 	<p>3RK1911-2BE50 3RK1911-2BE10 3RK1911-2BE30</p>
<p>⑧ Power connection cables, assembled at one end Power connection cable for ET 200pro motor starters, open at one end, for HAN Q4/2, angular, insert turned at isolator module end, 4 x 4 mm²</p> <ul style="list-style-type: none"> • Length 1.5 m • Length 5.0 m 	<p>3RK1911-0DB13 3RK1911-0DB33</p>
<p>⑨ Power connection cables for isolator module, assembled at one end Power connection cable for ET 200pro isolator modules, open at one end, for HAN Q4/2, angular, insert turned at isolator module end, 4 x 4 mm²</p> <ul style="list-style-type: none"> • Length 1.5 m • Length 5.0 m 	<p>3RK1911-0DF13 3RK1911-0DF33</p>
Power loop-through on the field device	
<p>③ Power jumper plug</p>	<p>3RK1922-2BQ00</p>
<p>⑦ Power loop-through plugs Connector set for power loop-through for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angular outgoing feeder, pin insert for HAN Q4/2, incl. gland</p> <ul style="list-style-type: none"> • 4 male contacts 2.5 mm² • 4 male contacts 4 mm² 	<p>3RK1911-2BF50 3RK1911-2BF10</p>
Motor cable	
<p>④ Motor connection plugs 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</p> <ul style="list-style-type: none"> • 8 male contacts 1.5 mm² • 6 male contacts 2.5 mm² 	<p>3RK1902-0CE00 3RK1902-0CC00</p>
<p>⑤ Motor plugs 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</p> <ul style="list-style-type: none"> • 7 female contacts 1.5 mm² • 7 female contacts 2.5 mm² 	<p>3RK1911-2BM21 3RK1911-2BM22</p>
<p>⑥ Motor plugs with EMC suppressor circuit 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</p> <ul style="list-style-type: none"> • 7 female contacts 1.5 mm² • 7 female contacts 2.5 mm² 	<p>3RK1911-2BL21 3RK1911-2BL22</p>

Version	Article No.	
Motor cables (continued)		
<p>⑩ Motor cables, assembled at one end Open at one end, HAN Q8, angular, length 5 m</p> <ul style="list-style-type: none"> • Motor cable for motor without brake, for ET 200pro, 4 x 1.5 mm² • Motor cable for motor with brake for ET 200pro, 6 x 1.5 mm² 	<p>3RK1911-0EB31</p> <p>3RK1911-0ED31</p>	
Power bus		
<p>⑫ Power T terminal connectors For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cables at any point of the power bus, by insulation displacement connection, used with preassembled bus segments</p> <ul style="list-style-type: none"> • 2.5 mm² / 4 mm² • 4 mm² / 6 mm² 	<p>3RK1911-2BF01</p> <p>3RK1911-2BF02</p>	
<p>⑬ Power double-T terminal connectors For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments, connection of two motor starters possible</p> <ul style="list-style-type: none"> • 4 mm² / 6 mm² 	<p>3RK1911-2BG02</p>	
<p>Sealing set (comprising 2 seals) For power T/power double-T terminal connectors</p> <ul style="list-style-type: none"> • For power cables with Ø 10 ... 13 mm • For power cables with Ø 13 ... 16 mm • For power cables with Ø 16 ... 19 mm • For power cables with Ø 19 ... 22 mm • Blanking plugs 	<p>3RK1911-5BA00</p> <p>3RK1911-5BA10</p> <p>3RK1911-5BA20</p> <p>3RK1911-5BA30</p> <p>3RK1911-5BA50</p>	
Further accessories for energy connections		
 <p>3RK1902-0CW00</p>	<p>Crimping tools for pins/sockets 4 mm² and 6 mm²</p> <p>3RK1902-0CW00</p>	
	<p>Dismantling tools</p> <ul style="list-style-type: none"> • For male and female contacts for 9-pin HAN Q4/2 inserts • For male and female contacts for 9-pin HAN Q8 inserts 	<p>3RK1902-0AB00</p> <p>3RK1902-0AJ00</p>
 <p>3RK1902-0CK00</p>	<p>Sealing caps For 9-pin power socket connectors</p> <ul style="list-style-type: none"> • 1 unit per pack • 10 units per pack 	<p>3RK1902-0CK00</p> <p>3RK1902-0CJ00</p>

More connection technology products can be found at our "Siemens Solution Partners Automation" website under "Distributed Field Installation System" technology: www.siemens.com/automation/partnerfinder

I/O systems

ET 200 systems without control cabinet

ET 200 pro - ET 200pro Safety motor starters Solutions local/PROFIsafe

Accessories for ET 200pro motor starters

Version	Article No.
Further accessories	
Module racks, wide¹⁾ <ul style="list-style-type: none"> • Length 500 mm • Length 1 000 mm • Length 2 000 mm 	6ES7194-4GB00-0AA0 6ES7194-4GB60-0AA0 6ES7194-4GB20-0AA0
Module racks, wide, compact¹⁾ <ul style="list-style-type: none"> • Length 500 mm • Length 1 000 mm • Length 2 000 mm 	6ES7194-4GD00-0AA0 6ES7194-4GD10-0AA0 6ES7194-4GD20-0AA0
Backplane bus modules 110 mm²⁾	3RK1922-2BA00
Backplane bus modules for Safety local isolator modules	3RK1922-2BA01
Handheld devices For ET 200pro motor starters (or for ET 200S High Feature and M200D motor starters) for local operation. The motor starter-specific serial interface cables must be ordered separately. The RS 232 interface cable 3RK1922-2BP00 is used for the MS ET 200pro.	3RK1922-3BA00
RS 232 interface cable Serial data connection between ET 200pro (or M200D) motor starters and the RS 232 interface of a PC/PG/laptop (with the Motor Starter ES software) or the handheld device 3RK1922-3BA00.	3RK1922-2BP00
USB interface cable, 2.5 m Serial data connection between ET 200pro (or M200D) motor starters and the USB interface of a PC/PG/laptop (with the Motor Starter ES software).	6SL3555-0PA00-2AA0
M12 sealing cap For sealing unused M12 input or output sockets (one set contains ten sealing caps)	3RK1901-1KA00
Manual SIMATIC ET 200pro Motor Starters	
The manual can be downloaded free of charge in PDF format from the Internet, see http://support.automation.siemens.com/WW/view/en/22332388	



3RK1922-3BA00

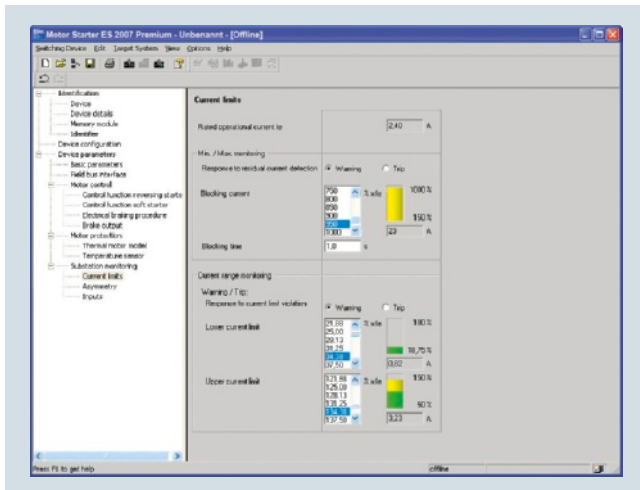


3RK1901-1KA00

¹⁾ 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).

²⁾ The backplane bus module is a prerequisite for operation of the ET 200pro motor starters and the optional modules.

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.

Note:

For more information, see pages 9/248 to 9/251.

I/O systems

ET 200 systems without control cabinet

ET 200pro – Add-on products for ET 200pro

EtherNet/IP interface module

Overview

An interface module (EtherNet/IP adapter) is provided for operating the ET 200pro on EtherNet/IP. It can be used together with system and IO components of the ET 200pro distributed I/O system.

Technical specifications

Article number	ZNX:EIP-200PRO
	ETHERNET/IP HEAD ASSEMBLY FOR ET 200PRO
Product type designation	
General information	
Vendor identification (VendorID)	0008h
Device identifier (DeviceID)	0240h
Supply voltage	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
from supply voltage 1L+, max.	250 mA
Power losses	
Power loss, typ.	6 W
Address area	
Addressing volume	
• Inputs	255 byte
• Outputs	255 byte
Interfaces	
PROFINET IO	
• Automatic detection of transmission speed	Yes
• Transmission rate, max.	100 Mbit/s
• Services	See manual
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• Bus fault BF (red)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
• Load voltage monitoring DC 24 V (green)	Yes

Article number	ZNX:EIP-200PRO
	ETHERNET/IP HEAD ASSEMBLY FOR ET 200PRO
Galvanic isolation	
between backplane bus and electronics	Yes
between supply voltage and electronics	Yes
Isolation	
Isolation checked with	707 V DC (type test)
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP66	Yes
• IP67	Yes
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C
• max.	55 °C
Storage/transport temperature	
• Min.	-40 °C
• max.	70 °C
Dimensions	
Width	135 mm
Height	130 mm
Depth	76 mm
Weights	
Weight, approx.	490 g

Technical specifications (continued)

Article number	ZNX:EIP-200PR-OCM1 ET200PRO, CM IM DP M12 / 7/8"
Product type designation	
Input current	
from load voltage 2L+ (without load), max.	No current input, only infeed current, max. 8 A
from supply voltage 1L+, max.	No current input, only infeed current, max. 8 A
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	100 Mbit/s; full-duplex, PROFINET
Accessories	
Function description	IM PN; 2xM12 2x7/8" interface module, power supply from 1L+ and 2L+ max. per 8 A, internal transfer 2L+ max. 8 A, 1L+ max. 5 A
belongs to product	M154-4PN High Feature
Weights	
Weight, approx.	540 g

Ordering data**SIMATIC ET 200pro interface module for EtherNet/IP**

Including:

- Bus termination module for ET 200pro
- Companion disk with the manuals and the Configuration Tool

Connecting module for EtherNet/IP

For connecting the interface module to EtherNet/IP

Article No.**ZNX:EIP200PRO****ZNX:EIP200PROC1**

I/O systems

ET 200 systems without control cabinet
ET 200eco PN

SIMATIC ET 200eco PN

Overview



- Compact block I/O for processing digital, analog and IO-Link signals for connecting to the PROFINET bus system
- Cabinet-free design with degree of protection IP65/66/67 with M12 connections
- Extremely rugged and resistant metal housing and casting
- 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)
 - 8 AI (TC, RTD)
 - 4 AO (U, I)
 - 4 IO-Link + 8 DI + 4 DO (1.3 A)
- Channel-specific diagnostics
- Ambient temperature range -40 °C to 60 °C

9

Technical specifications

Article number	6ES7141-6BF00-0AB0	6ES7141-6BG00-0AB0	6ES7141-6BH00-0AB0
	ET200ECO PN, 8DI, DC24V, 4XM12	ET200ECO PN, 8DI, DC24V, 8XM12	ET200ECO PN, 16DI, DC24V, 8XM12
Product type designation			
General information			
Vendor identification (VendorID)	002AH	002AH	002AH
Device identifier (DeviceID)	0306H	0306H	0306H
Supply voltage			
Rated value (DC)			
• 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
Input current			
Current consumption, typ.	100 mA	100 mA	100 mA
Encoder supply			
Number of outputs	4	8	8
Output current			
• nominal	100 mA; per output	100 mA; per output	100 mA; per output
24 V encoder supply			
• short-circuit protection	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7141-6BF00-0AB0 ET200ECO PN, 8DI, DC24V, 4XM12	6ES7141-6BG00-0AB0 ET200ECO PN, 8DI, DC24V, 8XM12	6ES7141-6BH00-0AB0 ET200ECO PN, 16DI, DC24V, 8XM12
Power losses			
Power loss, typ.	5.5 W	4.5 W	6.5 W
Digital inputs			
Number of digital inputs	8	8	16
• In groups of	2	1	2
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
Number of simultaneously controllable inputs			
all mounting positions			
- up to 60 °C, max.	8	8	16
Input voltage			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V
Input current			
• for signal "0", max. (permissible quiescent current)	1.5 mA	1.5 mA	1.5 mA
• for signal "1", typ.	7 mA	7 mA	7 mA
Input delay (for rated value of input voltage) for standard inputs			
- at "0" to "1", max.	typically 3 ms	typically 3 ms	typically 3 ms
- at "1" to "0", max.	typically 3 ms	typically 3 ms	typically 3 ms
Cable length			
• Unshielded, max.	30 m	30 m	30 m
Interfaces			
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX
Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
PROFINET IO			
• Number of PROFINET interfaces	1	1	1
• Autocrossing	Yes	Yes	Yes
• Automatic detection of transmission speed	Yes	Yes	Yes
• Integrated switch	Yes	Yes	Yes
PROFINET IO Device			
- IRT with the option "high flexibility" supported	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
Protocols			
PROFINET IO	Yes	Yes	Yes
PROFINET CBA	No	No	No
Supports protocol for PROFI-safe	No	No	No
Protocols (Ethernet)			
• SNMP	Yes	Yes	Yes
• DCP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
• ping	Yes	Yes	Yes
• ARP	Yes	Yes	Yes

I/O systems

ET 200 systems without control cabinet

ET 200eco PN

SIMATIC ET 200eco PN**Technical specifications** (continued)

Article number	6ES7141-6BF00-0AB0 ET200ECO PN, 8DI, DC24V, 4XM12	6ES7141-6BG00-0AB0 ET200ECO PN, 8DI, DC24V, 8XM12	6ES7141-6BH00-0AB0 ET200ECO PN, 16DI, DC24V, 8XM12
Interrupts/diagnostics/ status information			
Status indicator	Yes; Green LED	Yes; Green LED	Yes; Green LED
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnostic messages			
• Diagnostic functions	Yes	Yes	Yes
• Diagnostic information readable	Yes	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED	Yes; Green "ON" LED
• Wire break in signal transmitter 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
Galvanic isolation			
between the load voltages	Yes	Yes	Yes
between load voltage and all other switching components	No	No	No
between Ethernet and electronics	Yes	Yes	Yes
Galvanic isolation digital inputs			
• between the channels	No	No	No
Permissible potential difference			
between different circuits	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
Isolation			
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
Degree and class of protection			
Degree of protection to EN 60529			
• IP65	Yes	Yes	Yes
• IP66	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Connection method			
M12	Yes	Yes	Yes
Dimensions			
Width	30 mm	60 mm	60 mm
Height	200 mm	175 mm	175 mm
Depth	49 mm	49 mm	49 mm
Weights			
Weight (without packaging)	550 g	910 g	910 g

Technical specifications (continued)

Article number	6ES7142-6BF50-0AB0 ET200ECO PN, 8DO, DC24V/0.5A, 4XM12	6ES7142-6BF00-0AB0 ET200ECO PN, 8DO, DC24V/1.3A, 4XM12	6ES7142-6BG00-0AB0 ET200ECO PN, 8DO, DC24V/1.3A, 8XM12	6ES7142-6BR00-0AB0 ET200ECO PN, 8 DO, DC24V/2A, 8XM12	6ES7142-6BH00-0AB0 ET200ECO PN, 16DO DC24V/1.3A, 8XM12
Product type designation					
General information					
Vendor identification (VendorID)	002AH	002AH	002AH	002AH	002AH
Device identifier (DeviceID)	0306H	0306H	0306H	0306H	0306H
Supply voltage					
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
Input current					
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
Power losses					
Power loss, typ.	3 W	5.5 W	5.5 W	5 W	5.5 W
Digital outputs					
Number of digital outputs	8	8	8	8	16
• In groups of	8	4	4	4	8
short-circuit protection	Yes	Yes	Yes	Yes	Yes
• 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
Controlling a digital input	Yes	Yes	Yes	Yes	Yes
Switching capacity of the outputs					
• on lamp load, max.	5 W	5 W	5 W	10 W	5 W
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)					
all mounting positions					
- up to 55 °C, max.		3.9 A			
- up to 60 °C, max.	4 A	2.6 A	3.9 A	3.9 A	3.9 A
Cable length					
• Unshielded, max.	30 m	30 m	30 m	30 m	30 m

I/O systems

ET 200 systems without control cabinet

ET 200eco PN

SIMATIC ET 200eco PN**Technical specifications** (continued)

Article number	6ES7142-6BF50-0AB0 ET200ECO PN, 8DO, DC24V/0.5A, 4XM12	6ES7142-6BF00-0AB0 ET200ECO PN, 8DO, DC24V/1.3A, 4XM12	6ES7142-6BG00-0AB0 ET200ECO PN, 8DO, DC24V/1.3A, 8XM12	6ES7142-6BR00-0AB0 ET200ECO PN, 8 DO, DC24V/2A, 8XM12	6ES7142-6BH00-0AB0 ET200ECO PN, 16DO DC24V/1.3A, 8XM12
Interfaces					
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
PROFINET IO					
• Number of PROFINET interfaces	1	1	1	1	1
• 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					
- IRT with the option "high flexibility" supported	Yes	Yes	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes	Yes	Yes
Protocols					
PROFINET IO	Yes	Yes	Yes	Yes	Yes
PROFINET CBA	No	No	No	No	No
Supports protocol for PROFIsafe	No	No	No	No	No
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
Interrupts/diagnostics/ status information					
Status indicator	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostic messages					
• Diagnostic functions	Yes	Yes	Yes	Yes	Yes
• Diagnostic information readable	Yes	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	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

Technical specifications (continued)

Article number	6ES7142-6BF50-0AB0 ET200ECO PN, 8DO, DC24V/0.5A, 4XM12	6ES7142-6BF00-0AB0 ET200ECO PN, 8DO, DC24V/1.3A, 4XM12	6ES7142-6BG00-0AB0 ET200ECO PN, 8DO, DC24V/1.3A, 8XM12	6ES7142-6BR00-0AB0 ET200ECO PN, 8 DO, DC24V/2A, 8XM12	6ES7142-6BH00-0AB0 ET200ECO PN, 16DO DC24V/1.3A, 8XM12
Galvanic isolation					
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
Galvanic isolation digital outputs					
• between the channels	No	No	No	No	No
Permissible potential difference					
between different circuits	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
Isolation tested with					
• 24 V DC circuits	500 V	500 V	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	1 500 V; According to IEEE 802.3	1 500 V; According to IEEE 802.3
Degree and class of protection					
Degree of protection to EN 60529					
• IP65	Yes	Yes	Yes	Yes	Yes
• IP66	Yes	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes	Yes
Connection method					
M12	Yes	Yes	Yes	Yes	Yes
Dimensions					
Width	30 mm	30 mm	60 mm	60 mm	60 mm
Height	200 mm	200 mm	175 mm	175 mm	175 mm
Depth	49 mm	49 mm	49 mm	49 mm	49 mm
Weights					
Weight (without packaging)	550 g	550 g	910 g	910 g	910 g

I/O systems

ET 200 systems without control cabinet

ET 200eco PN

SIMATIC ET 200eco PN**Technical specifications (continued)**

Article number	6ES7147-6BG00-0AB0 ET200ECO PN, 8 DIO, DC24V/1.3A, 8XM12
Product type designation	
General information	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
Supply voltage	
Rated value (DC)	
• 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
Input current	
from load voltage 1L+ (unswitched voltage)	4 A
from load voltage 2L+, max.	4 A
Encoder supply	
Number of outputs	8
Output current	
• nominal	100 mA; per output
24 V encoder supply	
• short-circuit protection	Yes
Power losses	
Power loss, typ.	6.5 W
Digital inputs	
Number of digital inputs	8
• In groups of	4
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
all mounting positions	
- up to 60 °C, max.	8
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "0", max. (permissible quiescent current)	1.5 mA
• for signal "1", typ.	7 mA

Article number	6ES7147-6BG00-0AB0 ET200ECO PN, 8 DIO, DC24V/1.3A, 8XM12
Input delay (for rated value of input voltage) for standard inputs	
- at "0" to "1", max.	typically 3 ms
- at "1" to "0", max.	typically 3 ms
Cable length	
• Unshielded, max.	30 m
Digital outputs	
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
Controlling a digital input	Yes
Switching capacity of the outputs	
• on lamp load, max.	5 W
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)	
all mounting positions	
- up to 60 °C, max.	3.9 A
Cable length	
• Unshielded, max.	30 m
Interfaces	
Transmission procedure	100BASE-TX
Transmission rate, max.	100 Mbit/s
PROFINET IO	
• Number of PROFINET interfaces	1
• Autocrossing	Yes
• Automatic detection of transmission speed	Yes
• Integrated switch	Yes
PROFINET IO Device	
- IRT with the option "high flexibility" supported	Yes
- Prioritized startup	Yes

Technical specifications (continued)

Article number	6ES7147-6BG00-0AB0		Article number	6ES7147-6BG00-0AB0	
	ET200ECO PN, 8 DIO, DC24V/1.3A, 8XM12			ET200ECO PN, 8 DIO, DC24V/1.3A, 8XM12	
Protocols			Galvanic isolation		
PROFINET IO	Yes		between the load voltages	Yes	
PROFINET CBA	No		between load voltage and all other switching components	No	
Supports protocol for PROFI-safe PROFIBUS	No		between Ethernet and electronics	Yes	
Protocols (Ethernet)			Galvanic isolation digital inputs		
• TCP/IP	No		• between the channels	No	
• SNMP	Yes		Galvanic isolation digital outputs		
• DCP	Yes		• between the channels	No	
• LLDP	Yes		Permissible potential difference		
• ping	Yes		between different circuits	75V DC/60V AC	
• ARP	Yes		Isolation		
Interrupts/diagnostics/status information			tested with		
Status indicator	Yes; Green LED		• 24 V DC circuits	500 V	
Alarms			• Interface	1 500 V; According to IEEE 802.3	
• Diagnostic alarm	Yes		Degree and class of protection		
Diagnostic messages			Degree of protection to EN 60529		
• Diagnostic functions	Yes		• IP65	Yes	
• Diagnostic information readable	Yes		• IP66	Yes	
• Monitoring the supply voltage	Yes; Green "ON" LED		• IP67	Yes	
• Wire break in actuator cable	Yes		Connection method		
• Wire break in signal transmitter cable	Yes		M12	Yes	
• Short circuit	Yes		Dimensions		
• Short circuit encoder supply	Yes		Width	60 mm	
• Group error	Yes; Red/yellow "SF/MT" LED		Height	175 mm	
			Depth	49 mm	
			Weights		
			Weight (without packaging)	910 g	
Article number	6ES7144-6KD00-0AB0	6ES7144-6KD50-0AB0			
	ET200ECO PN, 8AI; 4 U/I; 4 RTD/TC 8XM12	ET200ECO PN, 8AI RTD/TC 8XM12			
Product type designation					
General information					
Vendor identification (VendorID)	002AH	002AH			
Device identifier (DeviceID)	0306H	0306H			
Supply voltage					
Rated value (DC)					
• 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			
Reverse polarity protection	Yes	Yes; against destruction			
Input current					
Current consumption, typ.	110 mA	110 mA			
Encoder supply					
Number of outputs	4				
24 V encoder supply					
• short-circuit protection	Yes; Electronic at 1.4 A				
• Output current, max.	1 A				

I/O systems

ET 200 systems without control cabinet

ET 200eco PN

SIMATIC ET 200eco PN**Technical specifications (continued)**

Article number	6ES7144-6KD00-0AB0 ET200ECO PN, 8AI; 4 U/I; 4 RTD/TC 8XM12	6ES7144-6KD50-0AB0 ET200ECO PN, 8AI RTD/TC 8XM12
Power losses		
Power loss, typ.	2.8 W	2.8 W
Analog inputs		
Number of analog inputs	8	8
• For voltage/current measurement	4	
• For resistance/resistance thermometer measurement	4	8
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 V to 5 V	Yes	
• -10 V to +10 V	Yes	
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• -20 mA to +20 mA	Yes	
• 4 mA to 20 mA	Yes	
Input ranges (rated values), thermoelements		
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
Input ranges (rated values), resistance thermometer		
• Ni 100	Yes	Yes
• Ni 1000	Yes	Yes
• Ni 120	Yes	Yes
• Ni 200	Yes	Yes
• Ni 500	Yes	Yes
• Pt 100	Yes	Yes
• Pt 1000	Yes	Yes
• Pt 200	Yes	Yes
• Pt 500	Yes	Yes
Input ranges (rated values), resistors		
• 0 to 150 ohms	Yes	Yes
• 0 to 300 ohms	Yes	Yes
• 0 to 600 ohms	Yes	Yes
• 0 to 3000 ohms	Yes	Yes
Thermocouple (TC)		
Temperature compensation		
- Parameterizable	Yes	Yes
- internal temperature compensation	Yes	Yes
- external temperature compensation with compensations socket	Yes	Yes
- external temperature compensation with Pt100		Yes
- dynamic reference temperature value		Yes
- for definable comparison point temperature		Yes
Cable length		
• shielded, max.	30 m	30 m

Technical specifications (continued)

Article number	6ES7144-6KD00-0AB0 ET200ECO PN, 8AI; 4 U/I; 4 RTD/TC 8XM12	6ES7144-6KD50-0AB0 ET200ECO PN, 8AI RTD/TC 8XM12
Analog value creation		
Analog value display	SIMATIC S7 format	SIMATIC S7 format
Measurement principle	integrating	integrating
Integration and conversion time/ resolution per channel		
• Resolution (incl. overrange)	15 bits + sign	15 bits + sign
• Integration time, parameterizable	Yes	Yes
• Integration time (ms)	2/16.67/20/100 ms	2/16.67/20/100 ms
• Interference voltage suppression for interference frequency f1 in Hz	500 / 60 / 50 / 10 Hz	500 / 60 / 50 / 10 Hz
• Conversion time (per channel)	4 / 19 / 22 / 102 ms	4 / 19 / 22 / 102 ms
Smoothing of measured values		
• Parameterizable	Yes	Yes
• Step: None	Yes; 1 x cycle time	Yes; 1 x cycle time
• Step: low	Yes; 4 x cycle time	Yes; 4 x cycle time
• Step: Medium	Yes; 16 x cycle time	Yes; 16 x cycle time
• Step: High	Yes; 64 x cycle time	Yes; 64 x cycle time
Encoder		
Number of connectable encoders, max.	8	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 two-wire connection	Yes	Yes
• for resistance measurement with three-wire connection	Yes	Yes
• for resistance measurement with four-wire connection	Yes	Yes
Errors/accuracies		
Linearity error (relative to input range), (+/-)	0.01 %	0.01 %
Temperature error (relative to input range), (+/-)	U: 0.0035%/°C; I: 0.006%/°C; RTD: 0.0005%/°C; TC: 0.0035%/°C	RTD: 0.0005%/°C; TC: 0.0035%/°C
Crosstalk between the inputs, min.	85 dB	-85 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.008 %	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	46 dB
• Common mode interference, min.	70 dB	70 dB

I/O systems

ET 200 systems without control cabinet

ET 200eco PN

SIMATIC ET 200eco PN**Technical specifications** (continued)

Article number	6ES7144-6KD00-0AB0 ET200ECO PN, 8AI; 4 U/I; 4 RTD/TC 8XM12	6ES7144-6KD50-0AB0 ET200ECO PN, 8AI RTD/TC 8XM12
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Transmission rate, max.	100 Mbit/s	100 Mbit/s
PROFINET IO		
• Number of PROFINET interfaces	1	1
• Autocrossing	Yes	Yes
• Automatic detection of transmission speed	Yes	Yes
• Integrated switch	Yes	Yes
PROFINET IO Device		
- IRT with the option "high flexibility" supported	Yes	
- Prioritized startup	Yes	Yes
Protocols		
PROFINET IO	Yes	Yes
PROFINET CBA	No	No
Supports protocol for PROFI-safe	No	No
Protocols (Ethernet)		
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes
Interrupts/diagnostics/status information		
Status indicator	Yes	
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic functions	Yes	Yes
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED
• Short circuit encoder supply	Yes; per module	
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
• Overflow/underflow	Yes	Yes
Galvanic isolation		
between the load voltages	Yes	Yes
between load voltage and all other switching components	No	No
between Ethernet and electronics	Yes	Yes
Galvanic isolation analog inputs		
• between the channels	No	No

Technical specifications (continued)

Article number	6ES7144-6KD00-0AB0 ET200ECO PN, 8AI; 4 U/I; 4 RTD/TC 8XM12	6ES7144-6KD50-0AB0 ET200ECO PN, 8AI RTD/TC 8XM12
Permissible potential difference between inputs and MANA (UCM)	10 Vpp AC	10 Vpp AC
Isolation tested with		
• 24 V DC circuits	500 V	500 V
• Interface	1 500 V; According to IEEE 802.3	1 500 V; According to IEEE 802.3
Degree and class of protection		
Degree of protection to EN 60529		
• IP65	Yes	Yes
• IP66	Yes	Yes
• IP67	Yes	Yes
Connection method		
M12	Yes	Yes
Dimensions		
Width	60 mm	60 mm
Height	175 mm	175 mm
Depth	49 mm	49 mm
Weights		
Weight (without packaging)	930 g	930 g

Article number	6ES7145-6HD00-0AB0 ET200ECO PN, 4AO U/I 4XM12
Product type designation	
General information	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption, typ.	280 mA
Encoder supply	
Number of outputs	4
24 V encoder supply	
• short-circuit protection	Yes; Electronic at 1.4 A
• Output current, max.	1 A

Article number	6ES7145-6HD00-0AB0 ET200ECO PN, 4AO U/I 4XM12
Power losses	
Power loss, typ.	5.5 W
Analog outputs	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	30 mA
Current output, no-load voltage, max.	20 V
Output ranges, voltage	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for voltage output two-wire connection	Yes
• for current output two-wire connection	Yes

I/O systems

ET 200 systems without control cabinet

ET 200eco PN

SIMATIC ET 200eco PN**Technical specifications (continued)**

Article number	6ES7145-6HD00-0AB0 ET200ECO PN, 4AO U/I 4XM12
Load impedance (in rated range of output)	
• 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
Destruction limits against externally applied voltages and currents	
• Voltages at the outputs towards MANA	28.8 V permanent, 35 V for max. 500 ms
Cable length	
• shielded, max.	30 m
Analog value creation	
Analog value display	SIMATIC S7 format
Measurement principle	Resistor network
Integration and conversion time/ resolution per channel	
• Resolution (incl. overrange)	15 bits + 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
Errors/accuracies	
Output ripple (based on output area, bandwidth 0 to 50 kHz), (+/-)	U: ±0.6 mVrms; I: ±0.4 nArms
Linearity error (relative to output range), (+/-)	0.02 %
Temperature error (relative to output range), (+/-)	U: 0.001%/°C; I: 0.0025%/°C
Crosstalk between the outputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.008 %
Interfaces	
Transmission procedure	100BASE-TX
Transmission rate, max.	100 Mbit/s
PROFINET IO	
• Number of PROFINET interfaces	1
• Autocrossing	Yes
• Automatic detection of transmission speed	Yes
• Integrated switch	Yes
PROFINET IO Device	
- IRT with the option "high flexibility" supported	Yes
- Prioritized startup	Yes

Article number	6ES7145-6HD00-0AB0 ET200ECO PN, 4AO U/I 4XM12
Protocols	
PROFINET IO	Yes
PROFINET CBA	No
Supports protocol for PROFI-safe	No
Protocols (Ethernet)	
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes
Interrupts/diagnostics/ status information	
Status indicator	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED
• Wire break	Yes; Channel-by-channel with current output
• Short circuit	Yes; Channel-by-channel with voltage output
• Group error	Yes; Red/yellow "SF/MT" LED
Galvanic isolation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Galvanic isolation analog outputs	
• between the channels	No
Permissible potential difference	
between M internally and the outputs	10 Vpp AC
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP66	Yes
• IP67	Yes
Connection method	
M12	Yes
Dimensions	
Width	60 mm
Height	175 mm
Depth	49 mm
Weights	
Weight (without packaging)	930 g

Technical specifications (continued)

Article number	6ES7148-6JA00-0AB0 ET 200ECO PN: IO-LINK MASTER
Product type designation	
General information	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
Supply voltage	
Rated value (DC)	
• 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
Input current	
from load voltage 1L+ (unswitched voltage)	4 A
from load voltage 2L+, max.	4 A
Encoder supply	
Number of outputs	6
Output current	
• nominal	200 mA; 100 mA per output to X5-X6
24 V encoder supply	
• short-circuit protection	Yes
Power losses	
Power loss, typ.	8 W
Digital inputs	
Number of digital inputs	8
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
all mounting positions	
- up to 60 °C, max.	8
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
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.	typically 3 ms
- at "1" to "0", max.	typically 3 ms
Cable length	
• Unshielded, max.	30 m

Article number	6ES7148-6JA00-0AB0 ET 200ECO PN: IO-LINK MASTER
Digital outputs	
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
Controlling a digital input	Yes
Switching capacity of the outputs	
• on lamp load, max.	5 W
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)	
all mounting positions	
- up to 60 °C, max.	3.9 A
Cable length	
• Unshielded, max.	30 m
Interfaces	
Transmission procedure	100BASE-TX
Transmission rate, max.	100 Mbit/s
PROFINET IO	
• Number of PROFINET interfaces	1
• Autocrossing	Yes
• Automatic detection of transmission speed	Yes
• Integrated switch	Yes
PROFINET IO Device	
- IRT with the option "high flexibility" supported	Yes
- Prioritized startup	Yes
Protocols	
PROFINET IO	Yes
PROFINET CBA	No
Supports protocol for PROFI-safe	No
Protocols (Ethernet)	
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes

I/O systems

ET 200 systems without control cabinet

ET 200eco PN

SIMATIC ET 200eco PN**Technical specifications** (continued)

Article number	6ES7148-6JA00-0AB0 ET 200ECO PN: IO-LINK MASTER
IO-Link	
Number of ports	4
• of which simultaneously controllable	4
Transmission rate	4.8 kBd (COM1); 38.4 kBd (COM2)
Cable length unshielded, max.	20 m
Operating modes	
• IO-Link	Yes
• DI	Yes
• DQ	Yes
Connection of IO-Link devices	
• via three-wire connection	Yes
Interrupts/diagnostics/ status information	
Status indicator	Yes; Green LED
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Monitoring the supply voltage	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

Article number	6ES7148-6JA00-0AB0 ET 200ECO PN: IO-LINK MASTER
Galvanic isolation	
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
Permissible potential difference	
between different circuits	75V DC/60V AC
Isolation	
tested with	
• 24 V DC circuits	500 V
• Interface	1 500 V; According to IEEE 802.3
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP66	Yes
• IP67	Yes
Connection method	
M12	Yes
Dimensions	
Width	60 mm
Height	175 mm
Depth	49 mm
Weights	
Weight (without packaging)	910 g

Ordering data	Article No.	Article No.
ET 200eco PN digital input module <ul style="list-style-type: none"> 8 DI 24 V DC; 4 x M12, dual assignment, degree of protection IP67 8 DI 24 V DC; 8 x M12, degree of protection IP67 16 DI 24 V DC; 8 x M12, dual assignment, degree of protection IP67 	6ES7141-6BF00-0AB0 6ES7141-6BG00-0AB0 6ES7141-6BH00-0AB0	Accessories <ul style="list-style-type: none"> PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12 Terminal block for ET 200eco PN, 10 A insulation displacement terminals Spare fuses for terminal block, 10 units Mounting rail 0.5 m Profile screw for mounting rail, 50 units Sealing cap M12 for IP67 modules, 10 units Labels 10 x 7 mm, pastel turquoise, 816 units
ET 200eco PN digital output module <ul style="list-style-type: none"> 8 DO 24 V DC/0.5 A; 4 x M12, dual assignment, 1 load voltage supply DO; degree of protection IP67 8 DO 24 V DC/1.3 A; 4 x M12, dual assignment, degree of protection IP67 8 DO 24 V DC/1.3 A; 8 x M12, degree of protection IP67 8 DO 24 V DC/2 A; 8 x M12, degree of protection IP67 16 DO 24 V DC/1.3 A; 8 x M12, dual assignment, degree of protection IP67 	6ES7142-6BF50-0AB0 6ES7142-6BF00-0AB0 6ES7142-6BG00-0AB0 6ES7142-6BR00-0AB0 6ES7142-6BH00-0AB0	PROFINET M12 connector, for user assembly IE FC M12 connector PRO, for user assembly <ul style="list-style-type: none"> 1 unit 8 units
ET 200eco PN digital input/output modules <ul style="list-style-type: none"> 8 DI/DO 24 V DC/1.3 A; 8 x M12, degree of protection IP67 	6ES7147-6BG00-0AB0	PROFINET M12 connecting cables Preassembled connecting cables with 2 M12 connectors (D-coded) in various lengths: <ul style="list-style-type: none"> 0.3 m 0.5 m 1.0 m 1.5 m 2.0 m 3.0 m 5.0 m 10.0 m 15.0 m
ET 200eco PN analog input modules <ul style="list-style-type: none"> 8 AI 4 U/I + 4 RTD/TC; 8 x M12, degree of protection IP67 8 AI RTD/TC; 8 x M12, degree of protection IP67 	6ES7144-6KD00-0AB0 6ES7144-6KD50-0AB0	6XV1870-8AE30 6XV1870-8AE50 6XV1870-8AH10 6XV1870-8AH15 6XV1870-8AH20 6XV1870-8AH30 6XV1870-8AH50 6XV1870-8AN10 6XV1870-8AN15
ET 200eco PN analog output modules <ul style="list-style-type: none"> 4 AO U/I; 4 x M12, degree of protection IP67 	6ES7145-6HD00-0AB0	
ET 200eco PN IO-Link master module <ul style="list-style-type: none"> 4 IO-L + 8 DI + 4 DO 24 V DC/1.3 A; 8 x M12, degree of protection IP67 	6ES7148-6JA00-0AB0	M12 connector for 24 V DC load power supply Connection socket for 24 V DC incoming supply; 4-pin, A-coded, 3 units Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units
		M12 plug-in power cables Preassembled plug-in power cables, fitted at each end with M12 socket and plug 4 x 0.75 mm ² , in various lengths: <ul style="list-style-type: none"> 0.3 m 0.5 m 1.0 m 1.5 m 2.0 m 3.0 m 5.0 m 10.0 m 15.0 m
		M12 coupler plug Can be assembled, for connecting actuators or sensors, 5-pin
		Y cable M12 For double connection of I/O by means of single cable to ET 200, 5-pin

I/O systems

ET 200 systems without control cabinet
IO-Link master ET 200eco PN

IO-Link master ET 200eco PN

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 in the IP67 degree of protection with M12 connection system
- Extremely rugged and resistant metal enclosure and casting
- Compact module in enclosure 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 proximity detection without the need for a programming device
- Supply and load voltage connection: 2 x M12
- Channel-specific diagnostics

Technical specifications

Article number	6ES7148-6JA00-0AB0 ET 200ECO PN: IO-LINK MASTER
Product type designation	
General information	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
Supply voltage	
Rated value (DC)	
• 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
Input current	
from load voltage 1L+ (unswitched voltage)	4 A
from load voltage 2L+, max.	4 A
Encoder supply	
Number of outputs	6
Output current	
• nominal	200 mA; 100 mA per output to X5-X6
24 V encoder supply	
• short-circuit protection	Yes

Article number	6ES7148-6JA00-0AB0 ET 200ECO PN: IO-LINK MASTER
Power losses	
Power loss, typ.	8 W
Digital inputs	
Number of digital inputs	8
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
all mounting positions - up to 60 °C, max.	8
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
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.	typically 3 ms
- at "1" to "0", max.	typically 3 ms
Cable length	
• Unshielded, max.	30 m

Technical specifications (continued)

Article number	6ES7148-6JA00-0AB0 ET 200ECO PN: IO-LINK MASTER
Digital outputs	
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
Controlling a digital input	Yes
Switching capacity of the outputs	
• on lamp load, max.	5 W
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)	
all mounting positions	
- up to 60 °C, max.	3.9 A
Cable length	
• Unshielded, max.	30 m
Interfaces	
Transmission procedure	100BASE-TX
Transmission rate, max.	100 Mbit/s
PROFINET IO	
• Number of PROFINET interfaces	1
• Autocrossing	Yes
• Automatic detection of transmission speed	Yes
• Integrated switch	Yes
PROFINET IO Device	
- IRT with the option "high flexibility" supported	Yes
- Prioritized startup	Yes
Protocols	
PROFINET IO	Yes
PROFINET CBA	No
Supports protocol for PROFI-safe	No
Protocols (Ethernet)	
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes

Article number	6ES7148-6JA00-0AB0 ET 200ECO PN: IO-LINK MASTER
IO-Link	
Number of ports	4
• of which simultaneously controllable	4
Transmission rate	4.8 kBd (COM1); 38.4 kBd (COM2)
Cable length unshielded, max.	20 m
Operating modes	
• IO-Link	Yes
• DI	Yes
• DQ	Yes
Connection of IO-Link devices	
• via three-wire connection	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes; Green LED
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Monitoring the supply voltage	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
Galvanic isolation	
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
Permissible potential difference	
between different circuits	75V DC/60V AC
Isolation tested with	
• 24 V DC circuits	500 V
• Interface	1 500 V; According to IEEE 802.3
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP66	Yes
• IP67	Yes
Connection method	
M12	Yes
Dimensions	
Width	60 mm
Height	175 mm
Depth	49 mm
Weights	
Weight (without packaging)	910 g

I/O systems

ET 200 systems without control cabinet
IO-Link master ET 200eco PN

IO-Link master ET 200eco PN**Ordering data****Article No.****Article No.****IO-Link Master ET 200eco PN**

- 4 IO-L + 8 DI + 4 DO 24 V DC/
1.3 A; 8 x M12,
degree of protection IP67

6ES7148-6JA00-0AB0**Accessories**

- PD voltage distributor, 24 V DC;
1 X 7/8", 4 X M12
- Terminal block for ET 200eco PN,
10 A insulation displacement
terminals
- Spare fuses for terminal block,
10 units
- Mounting rail 0.5 m
- Profile screw for mounting rail,
50 units
- Sealing cap M12
for IP67 modules, 10 units
- Labels 10 x 7 mm,
pastel turquoise,
816 units

6ES7148-6CB00-0AA0**6ES7194-6CA00-0AA0****6ES7194-6HB00-0AA0****6ES7194-6GA00-0AA0****6ES7194-6MA00-0AA0****3RK1901-1KA00****3RT1900-1SB10****PROFINET M12 connector,
for user assembly**

IE FC M12 connector PRO,
for user assembly

- 1 unit
- 8 units

6GK1901-0DB20-6AA0**6GK1901-0DB20-6AA8****PROFINET M12 connecting
cables**

Preassembled connecting cables
with 2 M12 connectors (D-coded),
in various lengths:

- 0.3 m
- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10.0 m
- 15.0 m

6XV1870-8AE30**6XV1870-8AE50****6XV1870-8AH10****6XV1870-8AH15****6XV1870-8AH20****6XV1870-8AH30****6XV1870-8AH50****6XV1870-8AN10****6XV1870-8AN15****M12 connector for
24 V DC load power supply**

Connection socket for 24 V DC
incoming supply;
4-pin, A-coded, 3 units

6GK1907-0DC10-6AA3

Connector for loop-through
of 24 V DC;
4-pin, A-coded, 3 units

6GK1907-0DB10-6AA3**M12 plug-in power cables**

Preassembled plug-in power
cables, fitted at each end with M12
socket and plug 4 x 0.75 mm²,
in various lengths:

- 0.3 m
- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10.0 m
- 15.0 m

6XV1801-5DE30**6XV1801-5DE50****6XV1801-5DH10****6XV1801-5DH15****6XV1801-5DH20****6XV1801-5DH30****6XV1801-5DH50****6XV1801-5DN10****6XV1801-5DN15****Y cable M12**

For double connection of I/O by
means of a single-cable on ET200,
5-pin

6ES7194-6KA00-0XA0

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
- Failsafe DI modules 4/8 F-DI with safety-related signal processing according to PROFIsafe

Technical specifications

Article number	6ES7141-3BF00-0XA0 ET200ECO, BM141, 8DI, 24V DC	6ES7141-3BH00-0XA0 ET200ECO, BM141, 16DI, 24V DC	6ES7148-3FA00-0XB0 ET200ECO, EL-MOD., 4/8 F-DI, 24V DC
Product type designation			
General information			
Vendor identification (VendorID)	80DBh	80DAh	
FH technology			
Module for failsafe applications			Yes
Supply voltage			
Load voltage 1L+			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes	Yes	No
Input current			
from supply voltage 1L+, max.	70 mA; Typical	70 mA; Typical	100 mA
Encoder supply			
Number of outputs	8	8	2
Type of output voltage	24 V DC	24 V DC	min. L+ (-1.5 V)
short-circuit protection	Yes; Electronic	Yes; Electronic	Yes
Output current			
• nominal	1 A; Aggregate current up to 55 °C	1 A; Aggregate current up to 55 °C	300 mA
Power losses			
Power loss, typ.	2.4 W	3.6 W	3 W

I/O systems

ET 200 systems without control cabinet

ET 200eco

SIMATIC ET 200eco**Technical specifications (continued)**

Article number	6ES7141-3BF00-0XA0 ET200ECO, BM141, 8DI, 24V DC	6ES7141-3BH00-0XA0 ET200ECO, BM141, 16DI, 24V DC	6ES7148-3FA00-0XB0 ET200ECO, EL-MOD., 4/8 F-DI, 24V DC
Digital inputs			
Number of digital inputs	8	16	8; 8 single channel, 4 two-channel
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes
Number of simultaneously controllable inputs			
• Number of simultaneously controllable 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 voltage			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-30 to +5V
• for signal "1"	13 to 30V	13 to 30V	
Input current			
• for signal "1", typ.	7 mA	7 mA	3.7 mA
Input delay (for rated value of input voltage) for standard inputs			
- at "0" to "1", max.	3 ms; Typical	3 ms; Typical	
- at "1" to "0", max.	3 ms; Typical	3 ms; Typical	
Cable length			
• Unshielded, max.	30 m	30 m	30 m
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	No
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	
Interfaces			
PROFIBUS DP			
• 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
Protocols			
PROFIBUS DP	Yes	Yes	Yes
Interrupts/diagnostics/status information			
Status indicator	Yes	Yes	
Alarms			
• Alarms	No	No	
Diagnostic messages			
• Diagnostics	Yes; Diagnostic information readable	Yes; Diagnostic information readable	
Diagnostics 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

Technical specifications (continued)

Article number	6ES7141-3BF00-0XA0 ET200ECO, BM141, 8DI, 24V DC	6ES7141-3BH00-0XA0 ET200ECO, BM141, 16DI, 24V DC	6ES7148-3FA00-0XB0 ET200ECO, EL-MOD., 4/8 F-DI, 24V DC
Galvanic isolation			
between PROFIBUS DP and all other circuit components	Yes	Yes	Yes
Galvanic isolation digital inputs			
• between the channels	No	No	No
Permissible potential difference			
between different circuits	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
Isolation			
Isolation checked with	500 V DC	500 V DC	500V AC for 1 minute
Standards, approvals, certificates			
Highest safety class achievable in safety mode			
• SIL according to IEC 61508	No	No	SIL 2 (single-channel), SIL 3 (two-channel)
Dimensions			
Width	60 mm	60 mm	60 mm
Height	210 mm	210 mm	210 mm
Depth	28 mm	28 mm	28 mm
Weights			
Weight, approx.	210 g	210 g	220 g

Article number	6ES7142-3BF00-0XA0 ET200ECO, BM142, 8DO, DC 24V/2A	6ES7142-3BH00-0XA0 ET200ECO, BM142, 16DO 24V DC/0.5A
Product type designation		
General information		
Vendor identification (VendorID)	80DDh	80FBh
Supply voltage		
Load voltage 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
Input current		
from load voltage 2L+ (without load), max.	60 mA; Typical	80 mA; Typical
from supply voltage 1L+, max.	70 mA; Typical	70 mA; Typical
Power losses		
Power loss, typ.	4 W	4 W
Digital outputs		
Number of digital outputs	8	16
short-circuit protection	Yes	Yes
• Response threshold, typ.	4 A per channel	1.4 A (per channel)
Limitation of inductive shutdown voltage to	2L+ (-44 V)	2L+ (-47 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• on lamp load, max.	10 W	5 W

I/O systems

ET 200 systems without control cabinet

ET 200eco

SIMATIC ET 200eco**Technical specifications (continued)**

Article number	6ES7142-3BF00-0XA0 ET200ECO, BM142, 8DO, DC 24V/2A	6ES7142-3BH00-0XA0 ET200ECO, BM142, 16DO 24V DC/0.5A
Load resistance range		
• lower limit	12 Ω	12 Ω
• upper limit	4 kΩ	4 kΩ
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, DC-13	0.5 Hz; to IEC 947-5-1, DC-13
• on lamp load, max.	1 Hz	1 Hz
Aggregate current of outputs (per group)		
all mounting positions - 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!
Cable length		
• Unshielded, max.	30 m	30 m
Interfaces		
PROFIBUS DP		
• 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
Protocols		
PROFIBUS DP	Yes	Yes
Interrupts/diagnostics/ status information		
Status indicator	Yes	Yes
Alarms		
• Alarms	No	No
Diagnostic messages		
• 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
• Channel error indicator F (red)	No	No

Technical specifications (continued)

Article number	6ES7142-3BF00-0XA0 ET200ECO, BM142, 8DO, DC 24V/2A	6ES7142-3BH00-0XA0 ET200ECO, BM142, 16DO 24V DC/0.5A
Galvanic isolation		
between PROFIBUS DP and all other circuit components	Yes	Yes
Galvanic isolation digital outputs		
• between the channels	No	No
Permissible potential difference		
between different circuits	75V DC/60V AC	75V DC/60V AC
Isolation		
Isolation checked with	500 V DC	500 V DC
Dimensions		
Width	60 mm	60 mm
Height	210 mm	210 mm
Depth	28 mm	28 mm
Weights		
Weight, approx.	210 g	210 g
Article number	6ES7143-3BH00-0XA0 ET200ECO, BM143, 8DI/DO, 2A	6ES7143-3BH10-0XA0 ET200ECO, BM143, 8DI/8DO, 1.3A
Product type designation		
General information		
Vendor identification (VendorID)	80DCh	80FCh
Supply voltage		
Load voltage 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
Input current		
from load voltage 2L+ (without load), max.	60 mA; Typical	60 mA; Typical
from supply voltage 1L+, max.	70 mA; Typical	70 mA; Typical
Encoder supply		
Number of outputs	8	8
Type of output voltage	24 V DC	
short-circuit protection	Yes; Electronic	Yes; Electronic
Output current		
• nominal	0.75 A; up to 55°C max. 0.75 A (summation current)	1 A; Up to 55°C max. 1 A (summation current)
Power losses		
Power loss, typ.	5 W	5 W

I/O systems

ET 200 systems without control cabinet

ET 200eco

SIMATIC ET 200eco**Technical specifications (continued)**

Article number	6ES7143-3BH00-0XA0 ET200ECO, BM143, 8DI/DO, 2A	6ES7143-3BH10-0XA0 ET200ECO, BM143, 8DI/8DO, 1.3A
Digital inputs		
Number of digital inputs	8	8
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Number of simultaneously controllable inputs		
• Number of simultaneously controllable inputs	8; All mounting positions up to 55 °C	8; All mounting positions up to 55 °C
Input voltage		
• Type of input voltage	DC	DC
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	13 to 30V
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; Typical	3 ms; Typical
- at "1" to "0", max.	3 ms; Typical	3 ms; Typical
Digital outputs		
Number of digital outputs	8	8
short-circuit protection	Yes	Yes
• Response threshold, typ.	4 A per channel	4 A per channel
Limitation of inductive shutdown voltage to	2L+ (-44 V)	2L+ (-44 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• on lamp load, max.	10 W	10 W
Load resistance range		
• lower limit	12 Ω	12 Ω
• upper limit	4 kΩ	4 kΩ
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, DC-13	0.5 Hz; to IEC 947-5-1, DC-13
• on lamp load, max.	1 Hz	1 Hz
Aggregate current of outputs (per group)		
all mounting positions - 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!
Cable length		
• Unshielded, max.	30 m	30 m

Technical specifications (continued)

Article number	6ES7143-3BH0-0XA0 ET200ECO, BM143, 8DI/DO, 2A	6ES7143-3BH10-0XA0 ET200ECO, BM143, 8DI/8DO, 1.3A
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interfaces		
PROFIBUS DP		
• 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
Protocols		
PROFIBUS DP	Yes	Yes
Interrupts/diagnostics/ status information		
Status indicator	Yes	Yes
Alarms		
• Alarms	No	No
Diagnostic messages		
• 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
Galvanic isolation		
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
Permissible potential difference		
between different circuits	75V DC/60V AC	75V DC/60V AC
Isolation		
Isolation checked with	500 V DC	500 V DC
Dimensions		
Width	60 mm	60 mm
Height	210 mm	210 mm
Depth	28 mm	28 mm
Weights		
Weight, approx.	210 g	210 g
Article number		
	6ES7194-3AA00-0AA0 ET200ECO, CONNECTING BLOCK ECOFAST	6ES7194-3AA00-0BA0 ET200ECO, CONNECTING BLOCK, M12, 7/8"
Product type designation		
Power losses		
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.
Dimensions		
Width	79 mm	79 mm
Height	60 mm	60 mm
Depth	30 mm	29 mm
Weights		
Weight, approx.	313 g	392 g

I/O systems

ET 200 systems without control cabinet
ET 200eco

SIMATIC ET 200eco

Ordering data	Article No.	Article No.
ET 200eco basic modules BM 141 <ul style="list-style-type: none"> 8 DI DC 24 V 8 x M12, individual assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately 16 DI DC 24 V 8 x M12, double assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately 	6ES7141-3BF00-0XA0 6ES7141-3BH00-0XA0	Accessories for ECOFAST connection block
ET 200eco basic module BM 142 <ul style="list-style-type: none"> 8 DO DC 24 V/1.2 A 8 x M12, individual assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately 16 DO DC 24 V/0.5 A 8 x M12, double assignment, IP65/67; connection block 6ES7194-3AA00-0.A0 to be ordered separately 	6ES7142-3BF00-0XA0 6ES7142-3BH00-0XA0	PROFIBUS ECOFAST hybrid plug <ul style="list-style-type: none"> Female contact insert, straight 6GK1905-0CB00 Female contact insert, angled 6GK1905-0CD00 Male contact insert, straight 6GK1905-0CA00 Male contact insert, angled 6GK1905-0CC00
ET 200eco basic modules BM 143 <ul style="list-style-type: none"> 8 DI/8 DO, 2 A 8 x M12, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately 8 DI/8 DO, 1.3 A 8 x M12, double assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately 	6ES7143-3BH00-0XA0 6ES7143-3BH10-0XA0	PROFIBUS ECOFAST terminating plug ECOFAST terminating resistor for PROFIBUS DP <ul style="list-style-type: none"> 1 pack = 1 unit 6GK1905-0DA10 1 pack = 5 units 6GK1905-0DA00
ET 200eco basic modules BM 148 <ul style="list-style-type: none"> 4/8 F-DI, 8 x M12, connection block 6ES7194-3AA00-0.A0 to be ordered separately 	6ES7148-3FA00-0XB0	PROFIBUS ECOFAST Hybrid cable – Cu
ECOFAST connection block For ET 200eco, 2 x ECOFAST connection RS 485 identification connector for PROFIBUS DP, address setting	6ES7194-3AA00-0AA0	M12 connection block, 7/8" accessories
M12 connection block, 7/8" For ET 200eco, 2 x M12 and 2 x 7/8" 2 rotary coding switch for PROFIBUS DP, address setting	6ES7194-3AA00-0BA0	PROFIBUS M12 connection plug <ul style="list-style-type: none"> 1 pack = 5 units Male contact insert 6GK1905-0EA00 Female contact insert 6GK1905-0EB00
		PROFIBUS M12 connecting cable For PROFIBUS DP, 1 pack = 5 units <ul style="list-style-type: none"> Male contact insert 6GK1905-0EC00
		PROFIBUS M12 bus termination connector Preassembled 2-wire (inverse coded) with M12 connectors (straight) in various lengths: <ul style="list-style-type: none"> 0.3 m 6XV1830-3DE30 0.5 m 6XV1830-3DE50 1.0 m 6XV1830-3DH10 1.5 m 6XV1830-3DH15 2.0 m 6XV1830-3DH20 3.0 m 6XV1830-3DH30 5.0 m 6XV1830-3DH50 10.0 m 6XV1830-3DN10 15.0 m 6XV1830-3DN15 See http://support.automation.siemens.com/WW/view/en/26999294

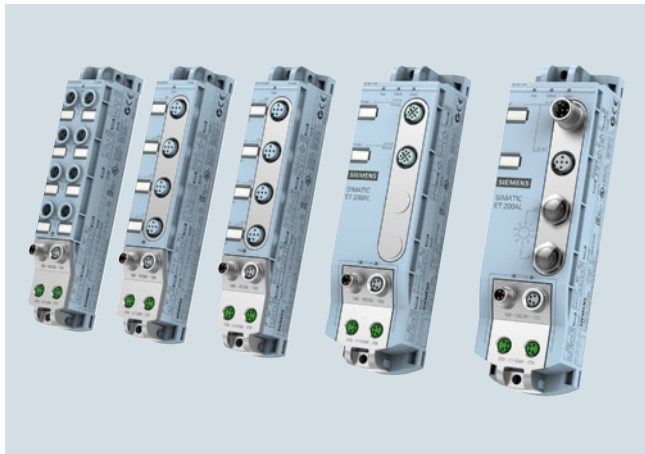
Ordering data	Article No.	Article No.
7/8" connector 1 pack = 5 units <ul style="list-style-type: none"> • Male contact insert, straight • Male contact insert, angled • Female contact insert, straight • Female contact insert, angled 	6GK1905-0FA00 3RK1902-3BA00 6GK1905-0FB00 3RK1902-3DA00	Other accessories
7/8" sealing caps 1 pack = 10 units	6ES7194-3JA00-0AA0	Identification connector For setting the PROFIBUS station address 6ES7194-1KB00-0XA0
SIMATIC NET energy cable 5-wire energy cable, stranded 5 x 1.5 mm ² , trailing-type <ul style="list-style-type: none"> • Sold by the meter, minimum order quantity = 20 m 	6XV1830-8AH10	Y circular connector M12 For double connection of sensors via a single cable, 5-pin; cannot be used for F DI 4/8 6ES7194-1KA01-0XA0
7/8" connecting cable to power supply Preassembled 5-wire cable with 7/8" connectors (straight) in various lengths: <ul style="list-style-type: none"> • 0.3 m • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10.0 m • 15.0 m Preassembled 5-wire cable with 7/8" connectors (straight) in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10.0 m • Other special lengths with 90° or 180° cable outlet 	6XV1822-5BE30 6XV1822-5BE50 6XV1822-5BH10 6XV1822-5BH15 6XV1822-5BH20 6XV1822-5BH30 6XV1822-5BH50 6XV1822-5BN10 6XV1822-5BN15 3RK1902-3NB30 3RK1902-3NB50 3RK1902-3NC10 see http://support.automation.siemens.com/WWW/view/en/26999294	Y cable M12 For double connection of sensors via a single cable, 5-pin; cannot be used for F DI 4/8 6ES7194-6KA00-0XA0
		M12 coupler plug For connecting actuators or sensors, 5-pin 3RK1902-4BA00-5AA0
		M12 covering caps For sealing unused I/O sockets 3RX9802-0AA00
		Labels 3RT1900-1SB20
		"Distributed Safety" V5.4 F programming tool Floating License for 1 user, with documentation, 3 languages (German, English, French), on CD, runs on STEP 7 V5.3 SP3 or higher 6ES7833-1FC02-0YA5
		"Distributed Safety" F programming tool Upgrade from V5.x to V5.4 6ES7833-1FC02-0YE5
		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) 6ES7998-8XC01-8YE0
		S7 Manual Collection update service for 1 year Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates 6ES7998-8XC01-8YE2

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL

Introduction

Overview



- Modular, distributed I/O system with compact I/O modules in IP65/67
- Especially easy and flexible installation, even in extremely confined spaces.
- Easy wiring
- Easy commissioning
- SIMATIC ET 200AL consists of the following components:
 - Interface module for communication with IO controllers on PROFINET.
 - Interface module for communication with all masters on the PROFIBUS.
 - Bus adapters for connection to the ET 200SP I/O system.
 - Different I/O modules, 300 mm wide.
- Maximum configuration of an ET 200AL station:
 - Up to 32 I/O modules with PROFINET or PROFIBUS in any combination
 - Up to 16 I/O modules at the ET 200SP I/O system in any combination
- Connection of the modules via an internal backplane bus established using bus cables (ET connection).

Highlights

- Compact dimensions
- Low weight
- Safety-oriented collective shutdown of the outputs (available soon)
- High degree of user-friendliness due to the following design features:
 - Flexible mounting in all positions possible due to screw fastening through the front or side
 - Direct installation on even surfaces or aluminum mounting rails
 - Labels for the identification of channels, modules and slots
 - Integrated cable tie opening
 - Clear and CAX-compliant interface designations
 - Uniform coloring of the system interfaces and system cables
 - 1:1 assignment of channel status LED, I/O socket and label
 - Pin assignment on the side
- I/O module portfolio comprising digital and analog modules as well as IO-Link communication module
- Ambient temperature range from -25 °C to +55 °C
- Extensive system functions
 - All interface and I/O modules support firmware update
 - Configuration control (option handling) via user software
 - System support of PROFlenergy for energy saving purposes
 - Consistent use of identification and maintenance data IM0 to IM3/4 (electronic rating plate) for fast electronic and unambiguous identification of individual modules (Article No., serial number, etc.).

Overview



- Interface module for linking the ET 200AL to PROFIBUS
- As DPV1 slave it handles the data exchange with the PROFIBUS master in the PLC
- Max. 32 I/O modules can be connected
- Max. data volume of 244 bytes, for input and output data respectively
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 99, can be set by means of rotary switch
- Identification and maintenance data IM0 ... IM3
- Firmware update
- Configuration management (option handling)

Technical specifications

Article number	6ES7157-1AA00-0AB0 ET 200AL, IM 157-1 DP
Product type designation	
General information	
HW functional status	E01
Firmware version	V1.0.0
Vendor identification (VendorID)	81A9H
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5
Configuration control	
for dataset	Yes
Supply voltage	
Load voltage 1L+	
• 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; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V
Input current	
Current consumption (rated value)	50 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Power losses	
Power loss, typ.	1.7 W
Address area	
Address space per station	
• Address space per station, max.	244 byte

Article number	6ES7157-1AA00-0AB0 ET 200AL, IM 157-1 DP
Interfaces	
Number of PROFIBUS interfaces	1
1st interface	
• Interface type	PROFIBUS DP
Interface types	
- RS 485	Yes
- M12 port	Yes; 2x M12 b-coded
Protocols	
- PROFIBUS DP slave	Yes
Interface types	
RS 485	
• Transmission rate, max.	12 Mbit/s
PROFIBUS	
Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- Direct data exchange (slave-to-slave communication)	Yes
- DPV0	Yes
- DPV1	Yes
Interrupts/diagnostics/status information	
Alarms	
• Alarms	Yes
Diagnostic messages	
• Diagnostic functions	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Connection display DP	Yes; Green LED
Galvanic isolation	
between the load voltages	Yes
between PROFIBUS DP and all other circuit components	Yes
Permissible potential difference	
between different circuits	60 V DC/50 V AC (basic insulation)

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL– Interface modules

IM 157-1 DP

Technical specifications (continued)

Article number	6ES7157-1AA00-0AB0 ET 200AL, IM 157-1 DP
Isolation	
Isolation checked with	707 V DC (type test)
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C
• max.	55 °C
Connection method	
Power supply	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	34 mm; Without connector
Weights	
Weight, approx.	211 g

Ordering data

Article No.

IM 157-1 DP interface module	6ES7157-1AA00-0AB0
For connecting ET 200AL to PROFIBUS	
Accessories	
Bus cable for backplane bus (ET connection)	
4-pole, shielded	
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	6ES7194-2LH03-0AA0
1 m	6ES7194-2LH10-0AA0
2 m	6ES7194-2LH20-0AA0
5 m	6ES7194-2LH50-0AA0
10 m	6ES7194-2LN10-0AA0
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	6ES7194-2LH03-0AB0
1 m	6ES7194-2LH10-0AB0
2 m	6ES7194-2LH20-0AB0
5 m	6ES7194-2LH50-0AB0
10 m	6ES7194-2LN10-0AB0
Pre-assembled at one end, 1 M8 connector	
2 m	6ES7194-2LH20-0AC0
5 m	6ES7194-2LH50-0AC0
10 m	6ES7194-2LN10-0AC0

Ordering data

Article No.

Power cable M8

4-pin
Pre-assembled at both ends, M8 connector and M8 socket

0.3 m	6ES7194-2LH03-1AA0
1 m	6ES7194-2LH10-1AA0
2 m	6ES7194-2LH20-1AA0
5 m	6ES7194-2LH50-1AA0
10 m	6ES7194-2LN10-1AA0

Pre-assembled at both ends, angled M8 connector and angled M8 socket

0.3 m	6ES7194-2LH03-1AB0
1 m	6ES7194-2LH10-1AB0
2 m	6ES7194-2LH20-1AB0
5 m	6ES7194-2LH50-1AB0
10 m	6ES7194-2LN10-1AB0

Pre-assembled at one end, M8 socket

2 m	6ES7194-2LH20-1AC0
5 m	6ES7194-2LH50-1AC0
10 m	6ES7194-2LN10-1AC0

M8 connector for ET connection

4-pin, shielded

M8 power connector

Male insert, 4-pin

ET connection FastConnect stripping tool

Stripping tool for stripping the ET connection bus cable

Labels

10 x 5 mm, RAL 9016;
5 frames with 40 labels each

6ES7194-2BA00-0AA0

Overview



- Interface module for linking the ET 200AL to PROFINET
- Handles data exchange with the PROFINET IO controller in the PLC
- Max. 32 I/O modules can be connected
- Max. data volume of 1430 bytes, for input and output data respectively
- Shortest bus cycle 250 µs
- Automatic power-up by means of topology recognition
- Autocrossover
- Shared device on up to 4 IO controllers
- Support for the MRP (media redundancy protocol) and MRPD (media redundancy with planned duplication) functions
- Identification and maintenance data IM0 ... IM4
- Firmware update
- Configuration management (option handling)
- PROFIenergy

Technical specifications

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
Product type designation	
General information	
HW functional status	E01
Firmware version	V1.0.0
Vendor identification (VendorID)	002AH
Product function	
• I&M data	Yes; I&M0 to I&M4
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
Configuration control	
for dataset	Yes
Supply voltage	
Load voltage 1L+	
• 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; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V
Input current	
Current consumption (rated value)	100 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Power losses	
Power loss, typ.	2.9 W
Address area	
Address space per station	
• Address space per station, max.	1 430 byte

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
Interfaces	
Number of PROFINET interfaces	1
1st interface	
• Interface type	PROFINET
Interface types	
- Integrated switch	Yes
- M12 port	Yes; 2x M12 d-coded
Protocols	
- PROFINET IO Device	Yes
M12 port	
• 10 Mbps	Yes; for Ethernet services
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes
PROFINET IO Device	
Services	
- Open IE communication	Yes
- IRT	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO controllers with shared device, max.	4
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL – Interface modules

IM 157-1 PN

Technical specifications (continued)

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
Interrupts/diagnostics/ status information	
Alarms	
• Alarms	Yes
Diagnostic messages	
• Diagnostic functions	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Connection display LINK TX/RX	Yes; 2x green LED
Galvanic isolation	
between the load voltages	Yes
between PROFINET and all other circuits	Yes
Permissible potential difference	
between different circuits	60 V DC/50 V AC (basic insulation)
Isolation	
Isolation checked with	707 V DC (type test)

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C
• max.	55 °C
Connection method	
Power supply	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	34 mm; Without connector
Weights	
Weight, approx.	263 g

Ordering data

Article No.

Article No.

IM 157-1 PN interface module

For connecting ET 200AL
to PROFINET

Accessories

Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends,
2 M8 connectors, angled

0.3 m	6ES7194-2LH03-0AA0
1 m	6ES7194-2LH10-0AA0
2 m	6ES7194-2LH20-0AA0
5 m	6ES7194-2LH50-0AA0
10 m	6ES7194-2LN10-0AA0

Pre-assembled at both ends,
2 M8 connectors, angled

0.3 m	6ES7194-2LH03-0AB0
1 m	6ES7194-2LH10-0AB0
2 m	6ES7194-2LH20-0AB0
5 m	6ES7194-2LH50-0AB0
10 m	6ES7194-2LN10-0AB0

Pre-assembled at one end,
1 M8 connector

2 m	6ES7194-2LH20-0AC0
5 m	6ES7194-2LH50-0AC0
10 m	6ES7194-2LN10-0AC0

Power cable M8

4-pin

Pre-assembled at both ends,
M8 connector and M8 socket

0.3 m	6ES7194-2LH03-1AA0
1 m	6ES7194-2LH10-1AA0
2 m	6ES7194-2LH20-1AA0
5 m	6ES7194-2LH50-1AA0
10 m	6ES7194-2LN10-1AA0

Pre-assembled at both ends,
angled M8 connector and angled
M8 socket

0.3 m	6ES7194-2LH03-1AB0
1 m	6ES7194-2LH10-1AB0
2 m	6ES7194-2LH20-1AB0
5 m	6ES7194-2LH50-1AB0
10 m	6ES7194-2LN10-1AB0

Pre-assembled at one end,
M8 socket

2 m	6ES7194-2LH20-1AC0
5 m	6ES7194-2LH50-1AC0
10 m	6ES7194-2LN10-1AC0

M8 connector for ET connection

4-pin, shielded

M8 power connector

Male insert, 4-pin

ET connection FastConnect stripping tool

Stripping tool for stripping the
ET connection bus cable

Labels

10 x 5 mm, RAL 9016;
5 frames with 40 labels each

Overview



- 30 mm wide modules with parameters and diagnostic functions
- 8-channel digital input module with M8 connection
- 8-channel digital input/output module with M8 connection

Technical specifications

Article number	6ES7141-5BF00-0BA0 ET 200AL, DI 8X24VDC, 8XM8
Product type designation	
General information	
HW functional status	E01
Firmware version	V1.0.0
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• 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; Against destruction; encoder power supply outputs applied with reversed polarity
Load voltage 2L+	
• Rated value (DC)	24 V
Input current	
Current consumption (rated value)	25 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value

Article number	6ES7141-5BF00-0BA0 ET 200AL, DI 8X24VDC, 8XM8
Encoder supply	
Number of outputs	8
24 V encoder supply	
• short-circuit protection	Yes; per module, electronic
• Output current, max.	0.7 A
Power losses	
Power loss, typ.	2.1 W
Digital inputs	
Number of digital inputs	8
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
all mounting positions - up to 55 °C, max.	8
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	3.2 mA
Input delay (for rated value of input voltage) for standard inputs	
- at "0" to "1", min.	1.2 ms
- at "0" to "1", max.	4.8 ms
- at "1" to "0", min.	1.2 ms
- at "1" to "0", max.	4.8 ms
Cable length	
• Unshielded, max.	30 m

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL – I/O modules

Digital I/O modules

Technical specifications (continued)

Article number	6ES7141-5BF00-0BA0 ET 200AL, DI 8X24VDC, 8XM8
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Short circuit	Yes; Sensor supply to M; module by module
Diagnostics indication LED	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
Galvanic isolation	
between the load voltages	Yes
Electrical isolation channels	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the supply voltage of the electronics	No

Article number	6ES7141-5BF00-0BA0 ET 200AL, DI 8X24VDC, 8XM8
Permissible potential difference	
between different circuits	60 V DC/50 V AC (basic insulation)
Isolation	
Isolation checked with	707 V DC (type test)
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C
• max.	55 °C
Connection method	
Inputs/outputs	M8, 3-pole
Power supply	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	30 mm
Height	159 mm
Depth	34 mm; Without connector
Weights	
Weight, approx.	145 g

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4X24VDC/ 0.5A, 8XM8
Product type designation	
General information	
HW functional status	E01
Firmware version	V1.0.0
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• 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; Against destruction; encoder power supply outputs applied with reversed polarity
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; against destruction; load increasing

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4X24VDC/ 0.5A, 8XM8
Input current	
Current consumption (rated value)	30 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Encoder supply	
Number of outputs	4
24 V encoder supply	
• short-circuit protection	Yes; per module, electronic
• Output current, max.	0.7 A
Power losses	
Power loss, typ.	2.6 W
Digital inputs	
Number of digital inputs	4; Parameterizable as DIQ
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
all mounting positions	
- up to 55 °C, max.	4
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	3.2 mA

Technical specifications (continued)

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4X24VDC/ 0.5A, 8XM8
Input delay (for rated value of input voltage)	
for standard inputs	
- at "0" to "1", min.	1.2 ms
- at "0" to "1", max.	4.8 ms
- at "1" to "0", min.	1.2 ms
- at "1" to "0", max.	4.8 ms
Cable length	
• Unshielded, max.	30 m
Digital outputs	
Number of digital outputs	8; 4 DQ fixed, 4 DIQ parameterizable
• In groups of	4; 2 load groups for 4 outputs each
short-circuit protection	Yes; per channel, electronic
• Response threshold, typ.	0.7 A
Limitation of inductive shutdown voltage to	2L+ (-47 V)
Switching capacity of the outputs	
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	24 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
Aggregate current of the outputs	
• Current per group, max.	2 A
Cable length	
• Unshielded, max.	30 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4X24VDC/ 0.5A, 8XM8
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes; channel by channel, parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Short circuit	Yes; Outputs to M; encoder supply to M; module by module
Diagnostics indication LED	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
Galvanic isolation	
between the load voltages	Yes
Electrical isolation channels	
• between the channels, in groups of	4; DIQ channels are isolated from DQ channels
• between the channels and the backplane bus	Yes
• between the channels and the supply voltage of the electronics	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+
Permissible potential difference	
between different circuits	60 V DC/50 V AC (basic insulation)
Isolation	
Isolation checked with	707 V DC (type test)
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C
• max.	55 °C
Connection method	
Inputs/outputs	M8, 3-pole
Power supply	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	30 mm
Height	159 mm
Depth	34 mm; Without connector
Weights	
Weight, approx.	145 g

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL – I/O modules

Digital I/O modules

Ordering data	Article No.	Ordering data	Article No.
Digital input module		Power cable M8	
8 DI 24 V DC	6ES7141-5BF00-0BA0	4-pin	
Digital input/output modules		Pre-assembled at both ends, M8 connector and M8 socket	
4 DIO / 4 DO, 24 V DC, 0.5 A	6ES7143-5BF00-0BA0	0.3 m	6ES7194-2LH03-1AA0
Accessories		1 m	6ES7194-2LH10-1AA0
Bus cable for backplane bus (ET connection)		2 m	6ES7194-2LH20-1AA0
Shielded, 4-pin		5 m	6ES7194-2LH50-1AA0
Pre-assembled at both ends, two M8 connectors, angled		10 m	6ES7194-2LN10-1AA0
0.3 m	6ES7194-2LH03-0AA0	Pre-assembled at both ends, angled M8 connector and angled M8 socket	
1 m	6ES7194-2LH10-0AA0	0.3 m	6ES7194-2LH03-1AB0
2 m	6ES7194-2LH20-0AA0	1 m	6ES7194-2LH10-1AB0
5 m	6ES7194-2LH50-0AA0	2 m	6ES7194-2LH20-1AB0
10 m	6ES7194-2LN10-0AA0	5 m	6ES7194-2LH50-1AB0
Pre-assembled at both ends, two M8 connectors, angled		10 m	6ES7194-2LN10-1AB0
0.3 m	6ES7194-2LH03-0AB0	Pre-assembled at one end, M8 socket	
1 m	6ES7194-2LH10-0AB0	2 m	6ES7194-2LH20-1AC0
2 m	6ES7194-2LH20-0AB0	5 m	6ES7194-2LH50-1AC0
5 m	6ES7194-2LH50-0AB0	10 m	6ES7194-2LN10-1AC0
10 m	6ES7194-2LN10-0AB0	M8 connector for ET connection	6ES7194-2AB00-0AA0
Pre-assembled at one end, one M8 connector		Shielded, 4-pin	
2 m	6ES7194-2LH20-0AC0	M8 power connector	6ES7194-2AA00-0AA0
5 m	6ES7194-2LH50-0AC0	Male insert, 4-pin	
10 m	6ES7194-2LN10-0AC0	ET connection FastConnect stripping tool	6ES7194-2KA00-0AA0
		Stripping tool for stripping the ET connection bus cable	
		Labels	6ES7194-2BA00-0AA0
		10 x 5 mm, RAL 9016; 5 frames with 40 labels each	

Overview



- 30-mm wide module with parameters and diagnostic functions
- For the connection of analog sensors without additional amplifiers
- 4-channel analog input module with M12 connection

Technical specifications

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4XU/I/RTD, 4XM12
Product type designation	
General information	
HW functional status	E01
Firmware version	V1.0.0
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• 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; against destruction
Input current	
Current consumption (rated value)	50 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Encoder supply	
Number of outputs	4
24 V encoder supply	
• short-circuit protection	Yes; per channel, electronic
• Output current, max.	0.5 A; per channel, total current of all channels max. 1 A
Power losses	
Power loss, typ.	2.5 W

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4XU/I/RTD, 4XM12
Analog inputs	
Number of analog inputs	4
• For current measurement	4
• For voltage measurement	4
• For resistance/resistance thermometer measurement	4
permissible input voltage for voltage input (destruction limit), max.	30 V
permissible input current for current input (destruction limit), max.	50 mA
Cycle time (all channels), min.	8 ms
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
• Input resistance (0 to 10 V)	10 MΩ
• 1 V to 5 V	Yes
• Input resistance (1 V to 5 V)	10 MΩ
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	50 Ω
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	50 Ω
Input ranges (rated values), resistance thermometer	
• Ni 100	Yes; Standard/climate
• Input resistance (Ni 100)	10 MΩ
• Pt 100	Yes; Standard/climate
• Input resistance (Pt 100)	10 MΩ

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL – I/O modules

Analog I/O modules

Technical specifications (continued)

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4XU/I/RTD, 4XM12
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• Input resistance (0 to 150 ohms)	10 MΩ
• 0 to 300 ohms	Yes
• Input resistance (0 to 300 ohms)	10 MΩ
Resistance thermometer (RTD)	
• Technical unit for temperature measurement	°C/°F/K
Cable length	
• shielded, max.	30 m
Analog value generation for the inputs	
Measurement principle	integrating
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes; channel by channel
• Integration time (ms)	0.3 / 16.7 / 20 / 60
• Conversion time (per channel)	2 / 18 / 21 / 61 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; 32 x cycle time
Encoder	
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 two-wire connection	Yes
• for resistance measurement with three-wire connection	Yes

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4XU/I/RTD, 4XM12
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.025 %
Temperature error (relative to input range), (+/-)	0.01 %/K
Crosstalk between the inputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.01 %
Operational limit in overall temperature range	
• Voltage, relative to input area, (+/-)	0.35 %
• Current, relative to input area, (+/-)	0.45 %
• Resistance, relative to input area, (+/-)	0.25 %
• Resistance thermometer, relative to input area, (+/-)	0.25 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input area, (+/-)	0.25 %
• Current, relative to input area, (+/-)	0.25 %
• Resistance, relative to input area, (+/-)	0.15 %
• Resistance thermometer, relative to input area, (+/-)	0.15 %
Interference voltage suppression for $f = n \times (f_1 \pm 0.5 \%)$, $f_1 =$ interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable
Diagnostic messages	
• Wire break	Yes; at 4 mA to 20 mA and 1 V to 5 V
• Short circuit	Yes; Encoder supply to M, channel by channel
• Overflow/underflow	Yes
Diagnostics indication LED	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED

Technical specifications (continued)

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4XU//RTD, 4XM12
Galvanic isolation	
between the load voltages	Yes
Electrical isolation channels	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the supply voltage of the electronics	No
Permissible potential difference	
between different circuits	60 V DC/50 V AC (basic insulation)
Isolation	
Isolation checked with	707 V DC (type test)
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4XU//RTD, 4XM12
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C
• max.	55 °C
Connection method	
Inputs/outputs	M12, 5-pole
Power supply	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	30 mm
Height	159 mm
Depth	34 mm; Without connector
Weights	
Weight, approx.	168 g

Ordering data

Ordering data	Article No.
Analog input modules	
4 AI U//RTD	6ES7144-5KD00-0BA0
Accessories	
Bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	6ES7194-2LH03-0AA0
1 m	6ES7194-2LH10-0AA0
2 m	6ES7194-2LH20-0AA0
5 m	6ES7194-2LH50-0AA0
10 m	6ES7194-2LN10-0AA0
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	6ES7194-2LH03-0AB0
1 m	6ES7194-2LH10-0AB0
2 m	6ES7194-2LH20-0AB0
5 m	6ES7194-2LH50-0AB0
10 m	6ES7194-2LN10-0AB0
Pre-assembled at one end, 1 M8 connector	
2 m	6ES7194-2LH20-0AC0
5 m	6ES7194-2LH50-0AC0
10 m	6ES7194-2LN10-0AC0

Ordering data	Article No.
Power cable M8	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.3 m	6ES7194-2LH03-1AA0
1 m	6ES7194-2LH10-1AA0
2 m	6ES7194-2LH20-1AA0
5 m	6ES7194-2LH50-1AA0
10 m	6ES7194-2LN10-1AA0
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	6ES7194-2LH03-1AB0
1 m	6ES7194-2LH10-1AB0
2 m	6ES7194-2LH20-1AB0
5 m	6ES7194-2LH50-1AB0
10 m	6ES7194-2LN10-1AB0
Pre-assembled at one end, M8 socket	
2 m	6ES7194-2LH20-1AC0
5 m	6ES7194-2LH50-1AC0
10 m	6ES7194-2LN10-1AC0
M8 connector for ET connection	6ES7194-2AB00-0AA0
4-pin, shielded	
M8 power connector	6ES7194-2AA00-0AA0
Male insert, 4-pin	
ET connection FastConnect stripping tool	6ES7194-2KA00-0AA0
Stripping tool for stripping the ET connection bus cable	
Labels	6ES7194-2BA00-0AA0
10 x 5 mm, RAL 9016; 5 frames with 40 labels each	

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL – I/O modules – Communication

CM IO-Link

Overview



- 30-mm wide CM IO-Link communication module
- For the connection of up to 4 IO-Link devices according to IO-Link Specification V1.0 and V1.1 and port Class B
- The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.2 and higher.

Technical specifications

Article number	6ES7147-5JD00-0BA0 ET 200AL, CM 4X IO-LINK, 4XM12
Product type designation	
General information	
HW functional status	E01
Firmware version	V1.0.0
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• 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; Against destruction; encoder power supply outputs applied with reversed polarity
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; against destruction; load increasing

Article number	6ES7147-5JD00-0BA0 ET 200AL, CM 4X IO-LINK, 4XM12
Input current	
Current consumption (rated value)	40 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Encoder supply	
Number of outputs	4
24 V encoder supply	
• short-circuit protection	Yes; per module, electronic
• Output current, max.	0.8 A; Total current of all ports
Power losses	
Power loss, typ.	2.6 W
IO-Link	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Cycle time, min.	2 ms
Size of process data, input per port	32 byte
Size of process data, input per module	32 byte
Size of process data, output per port	32 byte
Size of process data, output per module	32 byte
Memory size for device parameter	2 kbyte; for each port
Cable length unshielded, max.	20 m
Operating modes	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
Connection of IO-Link devices	
• Port type A	Yes; via 3-core cable
• Port type B	Yes; Additional device supply: 1.6 A total current of all ports

Technical specifications (continued)

Article number	6ES7147-5JD00-0BA0 ET 200AL, CM 4X IO-LINK, 4XM12
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
• Short circuit	Yes
Diagnostics indication LED	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
Galvanic isolation	
between the load voltages	Yes
Electrical isolation channels	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the supply voltage of the electronics	No

Article number	6ES7147-5JD00-0BA0 ET 200AL, CM 4X IO-LINK, 4XM12
Permissible potential difference	
between different circuits	60 V DC/50 V AC (basic insulation)
Isolation	
Isolation checked with	707 V DC (type test)
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C
• max.	55 °C
Connection method	
Inputs/outputs	M12, 5-pole
Power supply	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	30 mm
Height	159 mm
Depth	34 mm; Without connector
Weights	
Weight, approx.	168 g

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL – I/O modules – Communication

CM IO-Link**Ordering data****Article No.****Article No.****CM IO-Link**

For the connection of up to 4 IO-Link devices according to IO-Link Specification V1.0 and V1.1 and port Class B

6ES7147-5JD00-0BA0**Accessories****Bus cable for backplane bus (ET connection)**

4-pin, shielded

Pre-assembled at both ends, 2 M8 connectors

0.3 m

6ES7194-2LH03-0AA0

1 m

6ES7194-2LH10-0AA0

2 m

6ES7194-2LH20-0AA0

5 m

6ES7194-2LH50-0AA0

10 m

6ES7194-2LN10-0AA0

Pre-assembled at both ends, 2 M8 connectors, angled

0.3 m

6ES7194-2LH03-0AB0

1 m

6ES7194-2LH10-0AB0

2 m

6ES7194-2LH20-0AB0

5 m

6ES7194-2LH50-0AB0

10 m

6ES7194-2LN10-0AB0

Pre-assembled at one end, 1 M8 connector

2 m

6ES7194-2LH20-0AC0

5 m

6ES7194-2LH50-0AC0

10 m

6ES7194-2LN10-0AC0**Power cable M8**

4-pin

Pre-assembled at both ends, M8 connector and M8 socket

0.3 m

6ES7194-2LH03-1AA0

1 m

6ES7194-2LH10-1AA0

2 m

6ES7194-2LH20-1AA0

5 m

6ES7194-2LH50-1AA0

10 m

6ES7194-2LN10-1AA0

Pre-assembled at both ends, angled M8 connector and angled M8 socket

0.3 m

6ES7194-2LH03-1AB0

1 m

6ES7194-2LH10-1AB0

2 m

6ES7194-2LH20-1AB0

5 m

6ES7194-2LH50-1AB0

10 m

6ES7194-2LN10-1AB0

Pre-assembled at one end, M8 socket

2 m

6ES7194-2LH20-1AC0

5 m

6ES7194-2LH50-1AC0

10 m

6ES7194-2LN10-1AC0**M8 connector for ET connection****6ES7194-2AB00-0AA0**

4-pin, shielded

M8 power connector**6ES7194-2AA00-0AA0**

Male insert, 4-pin

ET connection FastConnect stripping tool**6ES7194-2KA00-0AA0**

Stripping tool for stripping the ET connection bus cable

Labels**6ES7194-2BA00-0AA0**

10 x 5 mm, RAL 9016;
5 frames with 40 labels each

Overview

- Pre-assembled cables in various designs and lengths:
 - For connecting the interface modules and I/O modules via the internal backplane bus (ET connection).
 - For power supply.

Technical specifications

Article number	6ES7194-2LH03-0AA0	6ES7194-2LH10-0AA0	6ES7194-2LH20-0AA0	6ES7194-2LH50-0AA0	6ES7194-2LN10-0AA0
	CONNECTING CABLE ET-CONNECTION, 0.3M	CONNECTING CABLE ET-CONNECTION, 1.0M	CONNECTING CABLE ET-CONNECTION, 2.0M	CONNECTING CABLE ET-CONNECTION, 5.0M	BUS CABLE ET-CONNECTION, 10M
Product type designation					
General information					
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded
Application/function	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection					
Degree of protection to EN 60529					
• IP65	Yes	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C
Storage/transport temperature					
• Ambient temperature during storage, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during storage, max.	80 °C	80 °C	80 °C	80 °C	80 °C
• Ambient temperature during transport, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during transport, max.	80 °C	80 °C	80 °C	80 °C	80 °C

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL – Accessories

Cables and connectors**Technical specifications** (continued)

Article number	6ES7194-2LH03-0AA0	6ES7194-2LH10-0AA0	6ES7194-2LH20-0AA0	6ES7194-2LH50-0AA0	6ES7194-2LN10-0AA0
	CONNECTING CABLE ET-CONNECTION, 0.3M	CONNECTING CABLE ET-CONNECTION, 1.0M	CONNECTING CABLE ET-CONNECTION, 2.0M	CONNECTING CABLE ET-CONNECTION, 5.0M	BUS CABLE ET-CONNECTION, 10M
Cables					
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Cable length	0.3 m	1 m	2 m	5 m	10 m
Number of electrical cores	4	4	4	4	4
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material					
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	metal	metal	metal	metal	metal
Material of core insulation	PE	PE	PE	PE	PE
Material of cable sheath	PVC	PVC	PVC	PVC	PVC
Material property halogen-free	No	No	No	No	No
Material property silicone-free	Yes	Yes	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7194-2LH03-0AB0	6ES7194-2LH10-0AB0	6ES7194-2LH20-0AB0	6ES7194-2LH50-0AB0	6ES7194-2LN10-0AB0
	CONNECTING CABLE ET-CON., ANGLED, 0.3M	CONNECTING CABLE ET-CON., ANGLED, 1.0M	CONNECTING CABLE ET-CON., ANGLED, 2.0M	CONNECTING CABLE ET-CON., ANGLED, 5.0M	BUS CABLE ET-CONNECTION, ANGLED, 10M
Product type designation					
General information					
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded
Application/function	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection					
Degree of protection to EN 60529					
• IP65	Yes	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C
Storage/transport temperature					
• Ambient temperature during storage, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during storage, max.	80 °C	80 °C	80 °C	80 °C	80 °C
• Ambient temperature during transport, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during transport, max.	80 °C	80 °C	80 °C	80 °C	80 °C
Cables					
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Cable length	0.3 m	1 m	2 m	5 m	10 m
Number of electrical cores	4	4	4	4	4
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL – Accessories

Cables and connectors

Technical specifications (continued)

Article number	6ES7194-2LH03-0AB0 CONNECTING CABLE ET-CON., ANGLED, 0.3M	6ES7194-2LH10-0AB0 CONNECTING CABLE ET-CON., ANGLED, 1.0M	6ES7194-2LH20-0AB0 CONNECTING CABLE ET-CON., ANGLED, 2.0M	6ES7194-2LH50-0AB0 CONNECTING CABLE ET-CON., ANGLED, 5.0M	6ES7194-2LN10-0AB0 BUS CABLE ET-CONNECTION, ANGLED, 10M
Mechanics/material					
Type of cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	metal	metal	metal	metal	metal
Material of core insulation	PE	PE	PE	PE	PE
Material of cable sheath	PVC	PVC	PVC	PVC	PVC
Material property halogen-free	No	No	No	No	No
Material property silicone-free	Yes	Yes	Yes	Yes	Yes

Article number	6ES7194-2LH20-0AC0 CONNECTING CABLE ET-CONNECTION, 2.0M	6ES7194-2LH50-0AC0 CONNECTING CABLE ET-CONNECTION, 5.0M	6ES7194-2LN10-0AC0 BUS CABLE ET-CONNECTION, 10M
Product type designation			
General information			
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Application/function	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection			
Degree of protection to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Storage/transport temperature			
• Ambient temperature during storage, min.	-40 °C	-40 °C	-40 °C
• Ambient temperature during storage, max.	80 °C	80 °C	80 °C
• Ambient temperature during transport, min.	-40 °C	-40 °C	-40 °C
• Ambient temperature during transport, max.	80 °C	80 °C	80 °C

Technical specifications (continued)

Article number	6ES7194-2LH20-0AC0 CONNECTING CABLE ET- CONNECTION, 2.0M	6ES7194-2LH50-0AC0 CONNECTING CABLE ET- CONNECTION, 5.0M	6ES7194-2LN10-0AC0 BUS CABLE ET-CONNECTION, 10M		
Cables					
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN		
Cable length	2 m	5 m	10 m		
Number of electrical cores	4	4	4		
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires		
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm		
Outer diameter of core insulation	1 mm	1 mm	1 mm		
Outer diameter of cable sheath	5 mm	5 mm	5 mm		
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²		
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm		
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm		
Bending radius for continuous bending	100 mm	100 mm	100 mm		
Color of cable sheath	green	green	green		
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange		
Weight per length	34 kg/km	34 kg/km	34 kg/km		
Mechanics/material					
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet		
Material of housing	metal	metal	metal		
Material of core insulation	PE	PE	PE		
Material of cable sheath	PVC	PVC	PVC		
Material property halogen-free	No	No	No		
Material property silicone-free	Yes	Yes	Yes		
<hr/>					
Article number	6ES7194-2LH03-1AA0 POWER CABLE M8, 0.3M	6ES7194-2LH10-1AA0 POWER CABLE M8, 1.0M	6ES7194-2LH20-1AA0 POWER CABLE M8, 2.0M	6ES7194-2LH50-1AA0 POWER CABLE M8, 5.0M	6ES7194-2LN10-1AA0 POWER CABLE M8, 10M
Product type designation					
General information					
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector
Application/function	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection					
Degree of protection to EN 60529					
• IP65	Yes	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C
Storage/transport temperature					
• Ambient temperature during storage, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during storage, max.	80 °C	80 °C	80 °C	80 °C	80 °C
• Ambient temperature during transport, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during transport, max.	80 °C	80 °C	80 °C	80 °C	80 °C

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL – Accessories

Cables and connectors

Technical specifications (continued)

Article number	6ES7194-2LH03-1AA0 POWER CABLE M8, 0.3M	6ES7194-2LH10-1AA0 POWER CABLE M8, 1.0M	6ES7194-2LH20-1AA0 POWER CABLE M8, 2.0M	6ES7194-2LH50-1AA0 POWER CABLE M8, 5.0M	6ES7194-2LN10-1AA0 POWER CABLE M8, 10M
Cables					
Cable designation	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50
Cable length	0.3 m	1 m	2 m	5 m	10 m
Number of electrical cores	4	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material					
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	plastic	plastic	plastic	plastic	plastic
Material of core insulation	PP	PP	PP	PP	PP
Material of cable sheath	PVC	PVC	PVC	PVC	PVC
Material property silicone-free	Yes	Yes	Yes	Yes	Yes
Product type designation					
General information					
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled
Application/function	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection					
Degree of protection to EN 60529					
• IP65	Yes	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7194-2LH03-1AB0 POWER CABLE M8, ANGLED, 0.3M	6ES7194-2LH10-1AB0 POWER CABLE M8, ANGLED, 1.0M	6ES7194-2LH20-1AB0 POWER CABLE M8, ANGLED, 2.0M	6ES7194-2LH50-1AB0 POWER CABLE M8, ANGLED, 5.0M	6ES7194-2LN10-1AB0 POWER CABLE M8, ANGLED, 10M
Ambient conditions					
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C
Storage/transport temperature					
• Ambient temperature during storage, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during storage, max.	80 °C	80 °C	80 °C	80 °C	80 °C
• Ambient temperature during transport, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during transport, max.	80 °C	80 °C	80 °C	80 °C	80 °C
Cables					
Cable designation	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50
Cable length	0.3 m	1 m	2 m	5 m	10 m
Number of electrical cores	4	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material					
Type of cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	plastic	plastic	plastic	plastic	plastic
Material of core insulation	PP	PP	PP	PP	PP
Material of cable sheath	PVC	PVC	PVC	PVC	PVC
Material property silicone-free	Yes	Yes	Yes	Yes	Yes

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL – Accessories

Cables and connectors

Technical specifications (continued)

Article number	6ES7194-2LH20-1AC0 POWER CABLE M8, 2.0M	6ES7194-2LH50-1AC0 POWER CABLE M8, 5.0M	6ES7194-2LN10-1AC0 POWER CABLE M8, 10M
Product type designation			
General information			
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Application/function	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection			
Degree of protection to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Storage/transport temperature			
• Ambient temperature during storage, min.	-40 °C	-40 °C	-40 °C
• Ambient temperature during storage, max.	80 °C	80 °C	80 °C
• Ambient temperature during transport, min.	-40 °C	-40 °C	-40 °C
• Ambient temperature during transport, max.	80 °C	80 °C	80 °C
Cables			
Cable designation	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50
Cable length	2 m	5 m	10 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km
Mechanics/material			
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	plastic	plastic	plastic
Material of core insulation	PP	PP	PP
Material of cable sheath	PVC	PVC	PVC
Material property silicone-free	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7194-2AA00-0AA0 M8 POWER CONNECTOR
Product type designation	
General information	
Product description	M8 plug connector with high degree of protection, 4-pin, plastic version
Application/function	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
Ambient conditions	
Ambient temperature during assembly, min.	-30 °C
Ambient temperature during assembly, max.	85 °C
Storage/transport temperature	
• Ambient temperature during storage, min.	-40 °C
• Ambient temperature during storage, max.	85 °C
• Ambient temperature during transport, min.	-40 °C
• Ambient temperature during transport, max.	85 °C
Mechanics/material	
Type of cable outlet	180 degree cable outlet
Material of housing	plastic
Dimensions	
Width	14 mm
Depth	47 mm

Article number	6ES7194-2AB00-0AA0 M8 CONNECTOR ET-CONNECTION
Product type designation	
General information	
Product description	M8 plug connector with high degree of protection, 4-pin, metal version
Application/function	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
Ambient conditions	
Ambient temperature during assembly, min.	-30 °C
Ambient temperature during assembly, max.	80 °C
Storage/transport temperature	
• Ambient temperature during storage, min.	-40 °C
• Ambient temperature during storage, max.	80 °C
• Ambient temperature during transport, min.	-40 °C
• Ambient temperature during transport, max.	80 °C
Mechanics/material	
Type of cable outlet	180 degree cable outlet
Material of housing	metal
Dimensions	
Width	14 mm
Depth	47 mm

I/O systems

ET 200 systems without control cabinet
SIMATIC ET 200AL – Accessories

Cables and connectors**Ordering data****Article No.****Article No.****Bus cable for backplane bus (ET connection)**

4-pin, shielded

Pre-assembled at both ends,
2 M8 connectors, angled

0.3 m

6ES7194-2LH03-0AA0

1 m

6ES7194-2LH10-0AA0

2 m

6ES7194-2LH20-0AA0

5 m

6ES7194-2LH50-0AA0

10 m

6ES7194-2LN10-0AA0Pre-assembled at both ends,
2 M8 connectors, angled

0.3 m

6ES7194-2LH03-0AB0

1 m

6ES7194-2LH10-0AB0

2 m

6ES7194-2LH20-0AB0

5 m

6ES7194-2LH50-0AB0

10 m

6ES7194-2LN10-0AB0Pre-assembled at one end,
1 M8 connector

2 m

6ES7194-2LH20-0AC0

5 m

6ES7194-2LH50-0AC0

10 m

6ES7194-2LN10-0AC0**Power cable M8**

4-pin

Pre-assembled at both ends,
M8 connector and M8 socket

0.3 m

6ES7194-2LH03-1AA0

1 m

6ES7194-2LH10-1AA0

2 m

6ES7194-2LH20-1AA0

5 m

6ES7194-2LH50-1AA0

10 m

6ES7194-2LN10-1AA0Pre-assembled at both ends,
angled M8 connector and angled
M8 socket

0.3 m

6ES7194-2LH03-1AB0

1 m

6ES7194-2LH10-1AB0

2 m

6ES7194-2LH20-1AB0

5 m

6ES7194-2LH50-1AB0

10 m

6ES7194-2LN10-1AB0Pre-assembled at one end,
M8 socket

2 m

6ES7194-2LH20-1AC0

5 m

6ES7194-2LH50-1AC0

10 m

6ES7194-2LN10-1AC0**M8 connector for ET connection****6ES7194-2AB00-0AA0**

4-pin, shielded

M8 power connector**6ES7194-2AA00-0AA0**

Male insert, 4-pin

**ET connection FastConnect
stripping tool****6ES7194-2KA00-0AA0**Stripping tool for stripping
the ET connection bus cable

Overview

- Labels for the identification of channels, modules and slots of ET 200AL components
- Can be used for interface modules and I/O modules

Ordering data**Labels**

10 x 5 mm, RAL 9016;
5 frames with 40 labels each

Article No.

6ES7194-2BA00-0AA0

I/O systems

Heating control systems

Introduction

Overview



Heating control systems

SIPLUS HCS heating control systems: Industrial heating processes – maximum precision and efficiency

In manufacturing processes where temperature plays a crucial role, deviations of just a few degrees can cause enormous quality problems. To avoid this and to minimize rejection rates, high-precision and reliable, individual control of the electrical heating elements is essential.

Nearly all industrially manufactured products undergo heat treatment. Even small deviations in the heating process can result in enormous negative effects on product quality.

To increase the quality and quantity of a heat-treated product, it is important to be able to focus the energy required with the highest level of spatial and temporal precision. The SIPLUS HCS ensures utmost precision in the control of electric heating units such as infrared heaters.

Three heating control systems are available:

- With integrated power outputs – compact design
- With integrated power outputs - modular design
- Without integrated power outputs

The SIPLUS HCS family of heating control systems saves time, costs and resources when it comes to configuring, commissioning, operation and maintenance.

This is achieved by:

- Simple integration into existing automation systems such as SIMATIC and SIMOTION
- Lower wiring costs and user-friendly engineering
- Intelligent diagnostics options for swift fault detection
- Service-friendly design thanks to ready-to-use function and data blocks
- Reduced volume in the control cabinet with space savings of up to 50 %

For more information, visit <http://www.siemens.com/siplus-hcs>.

Overview



SIPLUS HCS3200 heating control system with fixing brackets

The SIPLUS HCS3200 heating control system was developed as a compact solution for controlling linear heat emitter arrays.

Thanks to the high IP65 degree of protection, it can be used independently of a control cabinet at a distributed location near the emitters.

Technical specifications

Article number	6BK1932-0BA00-0AA0	
Product description	HCS3200 fan	
General data		
Version of the control of the heat emitter	Half-wave control	
Type of load	Resistive load	
Reference code in accordance with DIN EN 81346-2	Q	
Degree of pollution	2	
Approvals/certificates		
Certificate of suitability	CE	
Supply voltage		
Type of voltage of supply voltage	AC	
Supply voltage with AC Rated value	V	400
• Relative negative tolerance	%	10
• Relative positive tolerance	%	10
Supply voltage frequency		
• 1	Hz	50
• 2	Hz	60
• Relative symmetrical tolerance	%	5
Switching capacity current per phase Maximum	A	63
Breaking capacity, short-circuit current limit (Icu) at 400 V Rated value	kA	25
Electrical isolation version	Optocoupler between main circuit and PELV	
Power carrying capacity maximum permissible	W	25 200
Electrical connection version for supply voltage	Connector, 4-pole + PE	
Type of conductor cross-sections that can be connected		
• for supply voltage, finely stranded with prepared core ends	3x (6 ... 25 mm ²) and 1x PE (6 ... 16 mm ²)	
• for AWG cables, for supply voltage	AWG	3x (8 ... 4)

Article number	6BK1932-0BA00-0AA0	
Power electronics		
Number of outputs		
• for fans	1	
• for heating power	9	
Number of heat emitters per output Maximum	1	
Output voltage at the output		
• for heating power	V	400
• for fans	V	230
Power carrying capacity		
• per output	W	200 ... 4 000
• for fans, per output	W	60 ... 500
Output current at the output for heating power Rated value	A	10
Electrical isolation between outputs	No	
Design of the short-circuit protection		
• on output for fan	Safety fuse 4 A	
• for heating power, per output	Safety fuse 16 A	
Electrical connection version at the output for heater and fan	Connector, 20-pole + PE	
Type of conductor cross-sections that can be connected		
• For heater and fan, finely stranded with end sleeve	20x (1.5 ... 4 mm ²), 1x PE (1.5 ... 16 mm ²)	
• For AWG cables, stranded	AWG	20x (18 ... 12)
Measuring inputs for voltage		
Product function Voltage measurement	yes	

I/O systems

Heating control systems

SIPLUS HCS3200 heating control system

SIPLUS HCS3200 heating control system

Technical specifications (continued)

Article number	6BK1932-0BA00-0AA0	
Communications		
Protocol supported PROFIBUS DP protocol	yes	
Interface design	PROFIBUS DP	
Transmission rate With PROFIBUS DP Maximum	Mbps	12
Electrical connection version of the PROFIBUS interface	ECOFAST	
Display		
Number of status indicators	2	
Display version as LED status indication	LED green = status indicator, LED red = fault indicator	
Auxiliary circuit		
Type of power supply	External	
Type of voltage	DC	
Supply voltage for the electronics	V	24
• Relative symmetrical toler- ance of input voltage	%	20
Current consumption for the electronics Maximum	A	0.25
Monitoring functions		
Product function Temperature monitoring	yes	
Temperature monitoring version	NTC thermistor	
Diagnosics function	Voltage diagnostics	
• Fuse blown	yes	
• Wire break	yes	
• Heat emitter defect	yes	
Mechanical features		
Installation position	Vertical	
Type of mounting	Screw mounting	
Type of ventilation	Self-ventilation	
Shock resistance		
• according to IEC 60068-2-27	15 g / 11 ms / 3 shocks / axis	
• according to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks / axis	
Vibration resistance		
• during operation according to IEC 60068-2-6	10 ... 58 Hz / 0.15 mm, 58 ... 150 Hz / 1 g	
• during storage according to IEC 60068-2-6	5 ... 9 Hz / 3.5 mm, 9 ... 500 Hz / 1 g	
IP degree of protection	IP65	
Dimensions		
• Width	mm	300
• Height	mm	380
• Depth	mm	200

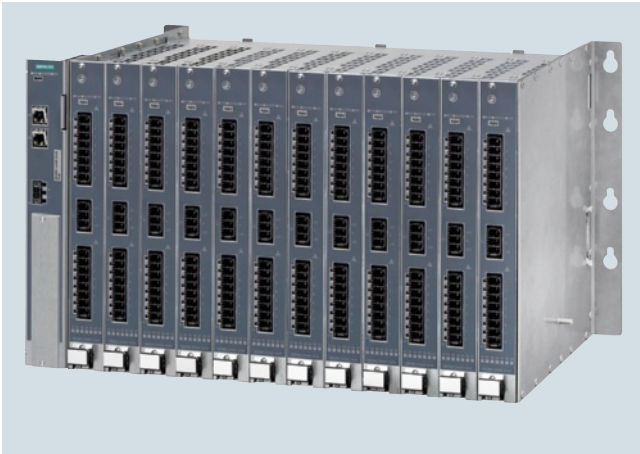
Article number	6BK1932-0BA00-0AA0	
Electromagnetic compatibility		
Conducted interference BURST according to IEC 61000-4-4	2 kV power supply lines / 1 kV signal cables	
Conducted interference SURGE according to IEC 61000-4-5	On supply lines: 1 kV symmetrical, 2 kV asymmetrical, (24 V DC supply only with external protective measure) for PROFIBUS DP cable: asymmetrical 1 kV	
Conducted interference as high frequency radiation according to IEC 61000-4-6	10 V (0.15 ... 80 MHz)	
Electrostatic discharging according to IEC 61000-4-2	4 kV contact discharging / 8 kV air discharging	
Field-based interference according to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)	
EMC interference emission	in accordance with IEC 61000-6-4:2007 + A1:2011	
Overvoltage category	III	
Climatic environmental conditions		
Ambient temperature		
• During operation	°C	0 ... 50
• During storage	°C	-40 ... +70
• During transport	°C	-40 ... +70
Atmospheric pressure		
• During operation	hPa	860 ... 1 080
• During storage	hPa	660 ... 1 080
Relative humidity		
• at 25 °C during operation, maximum	%	95
• at 50 °C during operation, maximum	%	50
Installation altitude at height above sea level Maximum	m	2 000

Ordering data

Article No.

SIPLUS HCS3200
heating control system
HCS3200 fan

6BK1932-0BA00-0AA0

Overview

SIPLUS HCS4200 heating control system

The SIPLUS HCS4200 heating control system controls and switches heat emitter arrays and other resistive loads in 230 V AC voltage supply systems in industrial environments.

Communication takes place via PROFINET, and together with the SIMATIC S7, SIMOTION or industrial PC, forms a modern and powerful automation system. The modular, compact and space-saving distributed I/O system can be adapted individually to suit the application.

I/O systems

Heating control systems

SIPLUS HCS4200 heating control system

Rack

Overview



SIPLUS HCS4200 heating control system

The rack constitutes the basic mechanical structure of SIPLUS HCS4200.

Technical specifications

Article number	6BK1942-0AA00-0AA0	
Product brand name	SIPLUS	
Product designation	Rack4200 for 12 POM	
General technical data:		
Equipment marking / acc. to DIN EN 81346-2	K	
Number of slots	12	
Type of power output / connectable	POM4220	
Supply voltage:		
Power capacity		
• without fan / per rack / maximum	kW	88
• with fan / per rack / maximum kW		193
Communication:		
Design of the interface	system interface	
Mechanical data:		
mounting position	horizontal	
Mounting type	Control cabinet backplane	
Type of ventilation	Self ventilation or forced ventilation	
Vibration resistance		
• during operation / acc. to IEC 60068-2-6	10 ... 58 Hz / 0.15 mm, 58 ... 150 Hz / 1g	
• during storage / acc. to IEC 60068-2-6	5 ... 9 Hz / 3.5 mm, 9 ... 500 Hz / 1g	
Shock resistance		
• acc. to IEC 60068-2-29	25 g / 6 ms / 1000 shocks / axis	
• acc. to IEC 60068-2-27	15g / 11 ms / 3 shocks / axis	

Article number	6BK1942-0AA00-0AA0	
Protection class IP	IP20	
Depth	mm	293
Height	mm	285
Width	mm	488
Electromagnetic compatibility:		
EMC emitted interference	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011	
Field-bound parasitic coupling / acc. to IEC 61000-4-3	10 V/m (80 ... 1000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)	
Electrostatic discharge / acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge	
Ambient conditions:		
Ambient temperature		
• during operation	0 ... 55	
• during storage	-25 ... +70	
• during transport	-25 ... +70	
Air pressure		
• during operation	860 ... 1 080	
• during storage	660 ... 1 080	
Degree of pollution		
2		
Installation altitude / at height above sea level / maximum	m	2 000
Relative humidity		
• at 25 °C / during operation / maximum	%	95
• at 50 °C / during operation / maximum	%	50
• at 50 °C / during operation / maximum / Note	95% at 25 °C, decreasing linearly to 50% at 50 °C	

Ordering data

SIPLUS HCS4200 Rack
Rack for accommodating up to 12 POM4320 power output modules

Article No.
6BK1942-0AA00-0AA0

Accessories

SIPLUS HCS4200 Fan Module
Attached to the top of the rack for accommodating up to 4 power output modules

Article No.

6BK1942-4AA00-0AA0

Blanking cover (10 items)
For covering unoccupied slots in the rack

6BK1942-6DA00-0AA0

Overview



The Central Interface Module (CIM) is the intelligent processor module of the SIPLUS HCS4200 heating control system.

Technical specifications

Article number	6BK1942-1AA00-0AA0
Product brand name	SIPLUS
Product designation	CIM4210 PROFINET
General technical data:	
Equipment marking / acc. to DIN EN 81346-2	K
Number of slots	1
Supply voltage:	
Type of voltage / of the supply voltage	DC
Supply voltage / 1 / for DC / Rated value	V 24
Relative negative tolerance / of the supply voltage	% 20
Relative positive tolerance / of the supply voltage	% 20
Active power consumption	W 3
Type of electrical connection / for supply voltage	Connector, 2 x 2-pole
Type of connectable conductor cross-section	
• for supply voltage / solid	1x (0.2 ... 2.5 mm ²)
• for supply voltage / finely stranded / with core end processing	1x (0.2 ... 2.5 mm ²)
• for AWG conductors / for supply voltage	26 ... 12

Article number	6BK1942-1AA00-0AA0
Communication:	
Design of the interface	PROFINET IO
Protocol / is supported	
• PROFIBUS DP protocol	-
• PROFINET IO protocol	Yes
Transfer rate	
• with PROFIBUS DP / maximum	-
• with PROFINET IO / maximum Mbit/s	100
Type of electrical connection	
• of the PROFIBUS interface	-
• of the PROFINET interface	2 x RJ45
Display:	
Number of status displays	3
Display version / as status display by LED	LED green = ready, LED yellow = heating on/off, LED red = error display
Mechanical data:	
Mounting position	vertical
Mounting type	Screw mounting to rack
Type of ventilation	Forced ventilation
Vibration resistance	
• during operation / acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1g
• during storage / acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1g
Shock resistance	
• acc. to IEC 60068-2-29	25 g / 6 ms / 1000 shocks / axis
• acc. to IEC 60068-2-27	15g / 11 ms / 3 shocks / axis
Protection class IP	IP20
Depth	mm 136
Height	mm 285
Width	mm 43

I/O systems

Heating control systems

SIPLUS HCS4200 heating control system

Central Interface Module (CIM)**Technical specifications (continued)**

Article number	6BK1942-1AA00-0AA0
Electromagnetic compatibility:	
EMC emitted interference	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011
Conducted interference / due to burst / acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV PROFINET cables
Conducted interference / due to surge / acc. to IEC 61000-4-5	DC supply lines: 0.5 kV symmetric and unsymmetric PROFINET cables: 1 kV unsymmetric
Conducted interference / due to high-frequency radiation / acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)
Field-bound parasitic coupling / acc. to IEC 61000-4-3	10 V/m (80 ... 1000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
Electrostatic discharge / acc. to IEC 61000-4-2	4 kV contact discharging, 8 kV air discharging
Overvoltage category	III
Ambient conditions:	
Ambient temperature	
• during operation	0 ... 55
• during storage	-25 ... +70
• during transport	-25 ... +70
Air pressure	
• during operation	860 ... 1 080
• during storage	660 ... 1 080
Degree of pollution	2
Installation altitude / at height above sea level / maximum	m 2 000
Relative humidity	
• at 25 °C / during operation / maximum	% 95
• at 50 °C / during operation / maximum	% 50
• at 50 °C / during operation / maximum / Note	95% at 25 °C, decreasing linearly to 50% at 50 °C

Ordering data

SIPLUS HCS4200 CIM4210 PROFINET
Central interface module with PROFINET communication

Article No.**6BK1942-1AA00-0AA0**

Overview



The power output modules (POMs) are an essential component of the SIPLUS HCS4200 heating control system. Up to 12 power output modules can be operated on one CIM.

POM4220 low-end power output module:

- 16 outputs for switching ohmic loads.
- A current of up to 6.3 A can be used per output channel.
- Connection of both phases and neutral conductor via a 3-pin connector (mating connector incl. in scope of delivery!).
- Connection of the heat emitters via two 8-pin connectors (mating connector incl. in scope of delivery!).
- One fuse per output for outgoing lines.
- Heat dissipation via an optional fan module on the upper side of the rack (for 4 POM4220).
- Module simply slides into the rack.
- And is secured by one screw at the bottom and another screw at the top.
- Three diagnostic LEDs for displaying the rack errors.
- Sixteen diagnostic LEDs for displaying the channel errors.

Technical specifications

Article number	6BK1942-2AA00-0AA0	
Product brand name	SIPLUS	
Product designation	HCS POM4220 Lowend	
General technical data:		
Type of load	Ohmic load	
Equipment marking / acc. to DIN EN 81346-2	Q	
Supply voltage:		
Type of voltage / of the supply voltage	AC	
Supply voltage / with AC / Rated value	V	230
Relative negative tolerance / of the supply voltage	%	10
Relative positive tolerance / of the supply voltage	%	10
Supply voltage frequency / 1 / Rated value	Hz	50
Supply voltage frequency / 2 / Rated value	Hz	60
Relative symmetrical tolerance / of the supply voltage frequency	%	5
Power capacity		
• of the module / with star connection / at 40 °C / with fan / maximum	kW	16.1
• of the module / with star connection / at 40 °C / without fan / maximum	kW	7.3
• maximum permissible	kW	16.1
Switching capacity current / per phase / maximum	A	35
Short-time withstand current (SCCR) / acc. to UL 508A	-	
Design of the electrical isolation	Optocoupler and/or protective impedance between main circuit and PELV	
Recovery time / after power failure / typical	s	1
Type of electrical connection / for supply voltage	Connector, 3-pin	

Article number	6BK1942-2AA00-0AA0	
Type of connectable conductor cross-section		
• for supply voltage / finely stranded / with core end processing	1x (0.25 ... 6 mm ²)	
• for AWG conductors / for supply voltage	24 ... 8	
Power Electronics:		
Control version / of heat emitters	Half-wave control	
Number of outputs / for heating power	16	
Number of heat emitters / per output / maximum	1	
Output voltage / at output / for heating power	V	230
Power capacity		
• per output	100 ... 1 449	
Output current / at output / for heating power / Rated value	A	6.3
Peak current		
Design of short-circuit protection / for heating power / per output	Safety fuse 6.3 A	
Melting I2t value	A ² ·s	57
Design of the overvoltage protection	Transil Diode	
Galvanic isolation / between the outputs	No	
Type of electrical connection / at output / for heating and fan	Connector, 8-pole	
Type of connectable conductor cross-section		
• for heating and fan / solid	1x (0.2 ... 10 mm ²)	
• for heating and fan / finely stranded / with core end processing	1x (0.25 ... 6 mm ²)	
• for AWG conductors / stranded	24 ... 8	

I/O systems

Heating control systems

SIPLUS HCS4200 heating control system

Power Output Module (POM)

Technical specifications (continued)

Article number	6BK1942-2AA00-0AA0
Communication:	
Design of the interface	system interface
Display:	
Number of status displays	19
Display version / as status display by LED	LED green = ready, LED yellow = heating on/off, LED red = error display, LED red = error for each channel
Auxiliary circuit:	
Design of the power supply	Power supply via rack
Active power consumption / maximum W	1
Protective and monitoring functions:	
Product function / Temperature monitoring	Yes
Type of the temperature monitoring	NTC thermistor
Diagnostics function	Voltage diagnostics
• Tripped fuse	Yes
• Cable break	Yes
• Heat emitter failure	Yes
Mechanical data:	
mounting position	vertical
Mounting type	Screw mounting to rack
Type of ventilation	Self ventilation or forced ventilation
Vibration resistance	
• during operation / acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1g
• during storage / acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1g
Shock resistance	
• acc. to IEC 60068-2-29	25 g / 6 ms / 1000 shocks / axis
• acc. to IEC 60068-2-27	15g / 11 ms / 3 shocks / axis
Protection class IP	IP20
Depth	mm 281
Height	mm 285
Width	mm 36

Article number	6BK1942-2AA00-0AA0
Electromagnetic compatibility:	
EMC emitted interference	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011 2 kV power supply lines, 2 kV load lines
Conducted interference / due to burst / acc. to IEC 61000-4-4	
Conducted interference / due to surge / acc. to IEC 61000-4-5	Supply and load lines: 1 kV symmetric, 2 kV unsymmetric PROFINET cables: 1 kV unsymmetric
Conducted interference / due to high-frequency radiation / acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)
Field-bound parasitic coupling / acc. to IEC 61000-4-3	10 V/m (80 ... 1000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
Electrostatic discharge / acc. to IEC 61000-4-2	4 kV contact discharging, 8 kV air discharging
Overvoltage category	III
Ambient conditions:	
Ambient temperature	
• during operation	0 ... 55
• during storage	-25 ... +70
• during transport	-25 ... +70
Air pressure	
• during operation	860 ... 1 080
• during storage	660 ... 1 080
Degree of pollution	2
Installation altitude / at height above sea level / maximum	2 000
Relative humidity	
• at 25 °C / during operation / maximum	% 95
• at 50 °C / during operation / maximum	% 50
• at 50 °C / during operation / maximum / Note	95% at 25 °C, decreasing linearly to 50% at 50 °C

Ordering data

Article No.

SIPLUS HCS4200 POM4220
Low-End

6BK1942-2AA00-0AA0

Power output module with 16 outputs for connecting resistive loads

Overview

SIPLUS HCS4300 heating control systems

The SIPLUS HCS4300 heating control system controls and switches heat emitter arrays and other resistive loads in 400 V/480 V voltage supply systems in industrial environments.

Communication takes place via PROFINET and provides, together with the SIMATIC S7, for example, a highly modern and powerful automation system.

I/O systems

Heating control system

SIPLUS HCS4300 heating control system

Central Interface Module (CIM)

Overview



The Central Interface Module (CIM) is the intelligent processor module of the SIPLUS HCS4300 heating control system.

Technical specifications

Article number	6BK1943-1AA00-0AA0	
Product brand name	SIPLUS	
Product designation	CIM4310 PROFINET	
General technical data:		
Equipment marking / acc. to DIN EN 81346-2	K	
Number of slots	1	
Type of power output / connectable	POM4320	
Power supply:		
Type of voltage / of the supply voltage	DC	
Supply voltage / 1 / for DC / Rated value	V	24
Relative negative tolerance / of the supply voltage	%	20
Relative positive tolerance / of the supply voltage	%	20
Active power consumption	W	3
Type of electrical connection / for supply voltage	Connector, 2 x 2-pole	
Type of connectable conductor cross-section		
• for supply voltage		
- solid	1x (0.2 ... 2.5 mm ²)	
- finely stranded / with core end processing	1x (0.2 ... 2.5 mm ²)	
• for AWG conductors / for supply voltage	26 ... 12	

Article number	6BK1943-1AA00-0AA0	
Communication:		
Design of the interface	PROFINET IO	
Protocol		
• is supported		
- PROFIBUS DP protocol	-	
- PROFINET IO protocol	Yes	
Transfer rate		
• with PROFIBUS DP / maximum	-	
• with PROFINET IO / maximum Mbit/s	100	
Type of electrical connection		
• of the PROFIBUS interface	-	
• of the PROFINET interface	2 x RJ45	
Number of status displays		
3		
Display version / as status display by LED		
LED green = ready, LED yellow = heating on/off, LED red = error display		
Mechanical data:		
Mounting position	vertical	
Mounting type	Screw mounting to POM	
Type of ventilation	Forced ventilation	
Shock resistance		
• acc. to IEC 60068-2-27	15g / 11 ms / 3 shocks / axis	
• acc. to IEC 60068-2-29	25 g / 6 ms / 1000 shocks / axis	
Vibration resistance		
• during operation / acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1g	
• during storage / acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1g	
Protection class IP		
IP20		
Width	mm	56
Height	mm	285
Depth	mm	136

Technical specifications (continued)		Ordering data	Article No.
Article number	6BK1943-1AA00-0AA0	HCS4300 CIM heating controller	6BK1 943-1AA00-0AA0
Electrical data:		CIM4310 PROFINET	
Conducted interference / due to burst / acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV PROFINET cables	Central Interface Module	
Conducted interference / due to surge / acc. to IEC 61000-4-5	DC supply lines: 0.5 kV symmetric and unsymmetric PROFINET cables: 1 kV unsymmetric		
Conducted interference / due to high-frequency radiation / acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)		
Electrostatic discharge / acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge		
Field-bound parasitic coupling / acc. to IEC 61000-4-3	10 V/m (80 ... 1000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)		
EMC emitted interference	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011		
Overvoltage category	III		
Ambient conditions:			
Ambient temperature			
• during operation	°C 0 ... 55		
• during storage	°C -25 ... +70		
• during transport	°C -25 ... +70		
Air pressure			
• during operation	hPa 860 ... 1 080		
• during storage	hPa 660 ... 1 080		
Relative humidity			
• at 25 °C / during operation / maximum	% 95		
• at 50 °C / during operation - maximum	% 50		
Note	95% at 25 °C, decreasing linearly to 50% at 50 °C		
Degree of pollution	2		
Installation altitude / at height above sea level / maximum	2 000		

I/O systems

Heating control systems

SIPLUS HCS4300 heating control system

Power Output Module (POM)

Overview



- Module (encapsulated) in metal enclosure
- 9 outputs for connecting resistive loads
- A current of up to 16 A per output can be used
- Connection of the phases via rear busbar adapter or connecting terminals
- 2-pin connection of heat emitter via mating connectors (mating connectors are included in scope of supply!)
- 2 fuses per output for supply and return circuit in a plug and pull fuse module
- Heat dissipation by fan mounted on top
- Internal serial interface
- Three diagnostics LEDs for indicating module faults
- Nine diagnostics LEDs for indicating channel faults

Technical specifications

Article number	6BK1943-2AA00-0AA0	
product brand name	SIPLUS	
Product designation	POM4320_IEC_STROMSCHIENEN-MONTAGE	
General technical data:		
Type of load	Ohmic load	
Equipment marking / acc. to DIN EN 81346-2	Q	
Supply voltage:		
Supply voltage / with AC / Rated value	V	400
Relative negative tolerance / of the supply voltage	%	10
Relative positive tolerance / of the supply voltage	%	30
Supply voltage frequency / 1 / Rated value	Hz	50
Supply voltage frequency / 2 / Rated value	Hz	60
Relative symmetrical tolerance / of the supply voltage frequency	%	5
Power capacity		
• of the module / with delta connection / at 40 °C / with fan / maximum	kW	69.1
• maximum permissible	kW	69.1
Switching capacity current / per phase / maximum	A	83
Short-time withstand current (SCCR) / acc. to UL 508A	-	-
Design of the electrical isolation	Optocoupler and/or protective impedance between main circuit and PELV	
Recovery time / after power failure / typical	s	1
Type of electrical connection / for supply voltage	Busbar adapter, 3-pole + PE for 60 mm busbar system	

Article number	6BK1943-2AA00-0AA0	
Type of connectable conductor cross-section		
• for supply voltage / solid	-	-
• for supply voltage / finely stranded / with core end processing	-	-
• for AWG conductors / for supply voltage	-	-
Power Electronics:		
Control version / of heat emitters	Half-wave control	
Number of outputs / for heating power	9	
Number of heat emitters / per output / maximum	1	
Output voltage / at output / for heating power	V	400
Power capacity		
• per output	200 ... 7 680	
Output current / at output / for heating power / Rated value	A	16
Peak current	A	150
Design of short-circuit protection / for heating power / per output	Fuse 16 A	
Melting I ² t value	A ² ·s	250
Design of the overvoltage protection	Transil Diode	
Galvanic isolation / between the outputs	No	
Type of electrical connection / at output / for heating and fan	Connector, 3-pole	
Type of connectable conductor cross-section		
• for heating and fan / solid	1x (0.2 ... 10 mm ²)	
• for heating and fan / finely stranded / with core end processing	1x (0.25 ... 6 mm ²)	
• for AWG conductors / stranded	24 ... 8	

Technical specifications (continued)

Article number	6BK1943-2AA00-0AA0
Measuring inputs	
Product function / voltage detection	Yes
Communication:	
Design of the interface	system interface
Display:	
Number of status displays	12
Display version / as status display by LED	LED green = ready, LED yellow = heating on/off, LED red = error display, LED red = error for each channel
Auxiliary circuit:	
Design of the power supply	Power supply via CIM
Active power consumption / W maximum	8
Protective and monitoring functions:	
Product function / Temperature monitoring	Yes
Type of the temperature monitoring	NTC thermistor
Diagnostics function	Voltage diagnostics
• Tripped fuse	Yes
• Cable break	Yes
• Heat emitter failure	Yes
Mechanical data:	
mounting position	vertical
Mounting type	Busbar mounting
Type of ventilation	Self-ventilation
Vibration resistance	
• during operation / acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1g
• during storage / acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1g
Shock resistance	
• acc. to IEC 60068-2-29	25 g / 6 ms / 1000 shocks / axis
• acc. to IEC 60068-2-27	15g / 11 ms / 3 shocks / axis
Protection class IP	IP20
Depth	mm 250
Height	mm 340
Width	mm 104

Article number	6BK1943-2AA00-0AA0
Electromagnetic compatibility:	
Conducted interference / due to burst / acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV load lines
Conducted interference / due to surge / acc. to IEC 61000-4-5	on supply and load lines: 1 kV symmetric, 2 kV unsymmetric
Conducted interference / due to high-frequency radiation / acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)
Field-bound parasitic coupling / acc. to IEC 61000-4-3	10 V/m (80 ... 1000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
Electrostatic discharge / acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge
Overvoltage category	III
Ambient conditions:	
Ambient temperature	
• during operation	0 ... 55
• during storage	-25 ... +70
• during transport	-25 ... +70
Air pressure	
• during operation	860 ... 1 080
• during storage	660 ... 1 080
Degree of pollution	2
Installation altitude / at height above sea level / maximum	m 2 000
Relative humidity	
• at 25 °C / during operation / maximum	% 95
• at 50 °C / during operation / maximum	% 50
• at 50 °C / during operation / maximum / Note	95% at 25 °C, decreasing linearly to 50% at 50 °C

Ordering data
Article No.

SIPLUS HCS4300
heating controller POM
POM4320 IEC
for busbar mounting

6BK1 943-2AA00-0AA0

I/O systems

PROFIBUS components

Power Rail Booster

Overview



- 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

Article No.

Power Rail Booster

Signal amplifier for PROFIBUS DP transmission over contact cables, max. 500 kbit/s

6ES7972-4AA02-0XA0

PRB segment controller

Automatic change-over switch between PRB segments

6ES7972-4AA50-0XA0

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

Article number	6ES7972-0AB01-0XA0 SIMATIC S7, DIAGNOSIS-REPEATER
Product type designation	
Supply voltage	
Rated value (DC)	Yes
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Interfaces	
Bus cables	FastConnect insulation displacement, 10 clamping cycles possible
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
Degree of protection to EN 60529	Yes
• IP20	Yes

Article number	6ES7972-0AB01-0XA0 SIMATIC S7, DIAGNOSIS-REPEATER
Ambient conditions	
Ambient temperature in operation	
• Min.	0 °C
• max.	60 °C
Storage/transport temperature	
• Min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at 25 °C
Connection method	
Power supply	Terminal block
Dimensions	
Width	80 mm
Height	125 mm
Depth	67.5 mm
Weights	
Weight, approx.	300 g

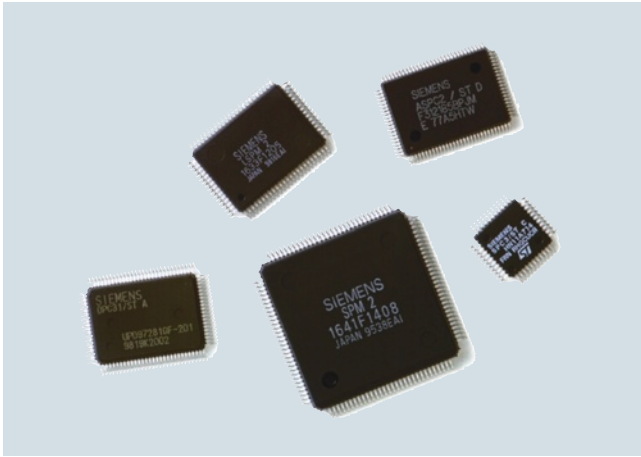
I/O systems

PROFIBUS components

Diagnostics repeater for PROFIBUS DP

Ordering data	Article No.	Ordering data	Article No.
RS 485 Diagnostics Repeater For connection of 1 or 2 segments to PROFIBUS DP; with online diagnostics functions for monitoring the bus cables	6ES7972-0AB01-0XA0	PROFIBUS FastConnect RS 485 bus connector with angular cable outlet (35°) With insulation displacement terminals, max. transfer rate 12 Mbit/s <ul style="list-style-type: none"> • Without PG interface • With PG interface 	6ES7972-0BA60-0XA0 6ES7972-0BB60-0XA0
Accessories		PROFIBUS FastConnect Stripping Tool Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	6GK1 905-6AA00
RS 485 bus connector with 90° cable outlet With screw terminals Max. transfer rate 12 Mbit/s <ul style="list-style-type: none"> • Without PG interface • With PG interface 	6ES7972-0BA12-0XA0 6ES7972-0BB12-0XA0	PROFIBUS FC Standard 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	6XV1 830-0EH10
PROFIBUS FastConnect bus connector RS 485 with 90° cable outlet With insulation displacement terminals Max. data transfer rate 12 Mbit/s Without PG interface <ul style="list-style-type: none"> • 1 unit • 100 units With PG interface <ul style="list-style-type: none"> • 1 unit • 100 units Without PG interface, grounding via control cabinet cover <ul style="list-style-type: none"> • 1 unit With PG interface, grounding via control cabinet cover <ul style="list-style-type: none"> • 1 unit 	6ES7972-0BA52-0XA0 6ES7972-0BA52-0XB0 6ES7972-0BB52-0XA0 6ES7972-0BB52-0XB0 6ES7972-0BA70-0XA0 6ES7972-0BB70-0XA0	S7 Manual Collection Electronic manuals on DVD, multilingual: 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)	6ES7998-8XC01-8YE0
RS 485 bus connector with angled cable outlet (35°) With screw terminals, max. transfer rate 12 Mbit/s <ul style="list-style-type: none"> • Without PG interface • With PG interface 	6ES7972-0BA42-0XA0 6ES7972-0BB42-0XA0	S7 Manual Collection update service for 1 year Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	6ES7998-8XC01-8YE2
		Connecting cable for PROFIBUS 12 Mbit/s, for PG connection to PROFIBUS DP, preassembled with 2 x 9-pin sub D connector, 3.0 m	6ES7901-4BD00-0XA0

Overview



- Easy connection of field devices to PROFIBUS
- Integrated low power management
- Different ASICs for the different functional requirements and application areas

Technical specifications

	LSPM 2	SPC 3	SPC 3LV	DPC 31
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 ²	2 cm ²	2 cm ²	4 cm ²
Delivery quantities (pcs.)	6/66/330/4950	6/96/750/960/4800	5/160/800/1000/4800	STEP B: 6/60/300/5100 STEP C1: 6/66/660/4620

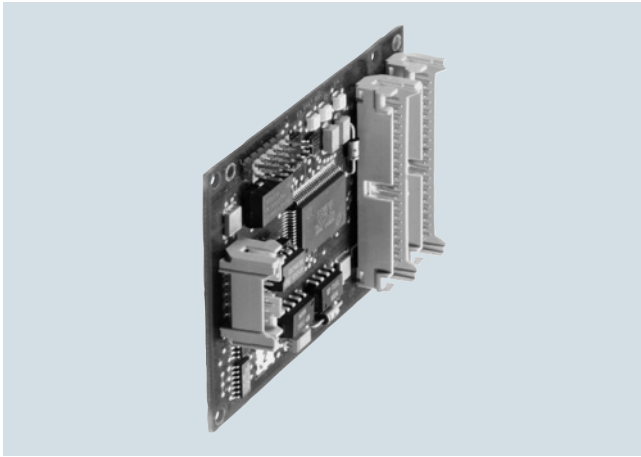
	SPC 4-2	ASPC 2	SIM 1-2	FOCSI
Protocol	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS PA	-
Application range	Intelligent slave application	Master application	Medium Attachment	Medium Management Unit
Transmission rate, max.	12 Mbit/s	12 Mbit/s	31.25 kbit/s	12 Mbit/s
Bus access	in ASIC	in ASIC	-	-
Automatic determination of transmission rate	yes	yes	-	-
Microprocessor required	yes	yes	-	-
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 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 ²	4 cm ²	36 mm ²	2 cm ²
Delivery quantities (pcs.)	5/160	6/66/660/4620	30/60/1000	40

I/O systems

PROFIBUS components

PROFIBUS DP ASICs

Ordering data	Article No.	Article No.	
ASIC ASPC 2 For constructing master interfaces (quantity discount) <ul style="list-style-type: none"> • 6 units (lead-free) • 66 units (lead-free) • 660 units (lead-free) • 4620 units (lead-free) 	6ES7195-0AA05-0XA0 6ES7195-0AA15-0XA0 6ES7195-0AA25-0XA0 6ES7195-0AA35-0XA0	ASIC DPC 31 STEP C1 For constructing intelligent DP slave interfaces (quantity discount) <ul style="list-style-type: none"> • 6 units (lead-free) • 66 units (lead-free) • 660 units (lead-free) • 4620 units (lead-free) 	6ES7195-0BF02-0XA0 6ES7195-0BF12-0XA0 6ES7195-0BF22-0XA0 6ES7195-0BF32-0XA0
ASIC LSPM 2 For constructing simple slave interfaces (quantity discount) <ul style="list-style-type: none"> • 6 units (lead-free) • 66 units (lead-free) • 330 units (lead-free) • 4950 units (lead-free) 	6ES7195-0BA02-0XA0 6ES7195-0BA12-0XA0 6ES7195-0BA22-0XA0 6ES7195-0BA32-0XA0	ASIC SPC 4-2 For constructing intelligent DP slave interfaces (quantity discount) <ul style="list-style-type: none"> • 5 units for laboratory development (lead-free) • 160 units (lead-free, 1 tray) 	6GK1588-3AA00 6GK1588-3AA15
ASIC SPC 3 For constructing intelligent DP slave interfaces (quantity discount) <ul style="list-style-type: none"> • 6 units (lead-free) • 96 units (lead-free) • 960 units (lead-free) • 4800 units (lead-free) • 750 units (lead-free) T&R 	6ES7195-0BD04-0XA0 6ES7195-0BD14-0XA0 6ES7195-0BD24-0XA0 6ES7195-0BD34-0XA0 6ES7195-0BD44-0XA0	ASIC SIM 1-2 For connection according to IEC H1 for PROFIBUS PA with a transmission rate of 31.25 kbit/s <ul style="list-style-type: none"> • 60 units (in tube) • 1000 units (tape & reel) 	6GK1588-3BB02 6GK1588-3BB21
ASIC SPC 3LV For constructing intelligent DP slave interfaces (quantity discount) <ul style="list-style-type: none"> • 5 units (lead-free) • 160 units (lead-free) • 800 units (lead-free) • 4800 units (lead-free) • 1000 units (lead-free) T&R 	6ES7195-0BG00-0XA0 6ES7195-0BG10-0XA0 6ES7195-0BG20-0XA0 6ES7195-0BG30-0XA0 6ES7195-0BG40-0XA0	Accessories	
ASIC DPC 31 STEP B For constructing intelligent DP slave interfaces (quantity discount) <ul style="list-style-type: none"> • 6 units (lead-free) • 60 units (lead-free) • 300 units (lead-free) • 5100 units (lead-free) 	6ES7195-0BE02-0XA0 6ES7195-0BE12-0XA0 6ES7195-0BE22-0XA0 6ES7195-0BE32-0XA0	Firmware for Siemens ASIC SPC 3 <ul style="list-style-type: none"> • DP firmware • DPV1 firmware • DPV1 firmware upgrade 	6ES7195-2BA00-0XA0 6ES7195-2BA01-0XA0 6ES7195-2BA02-0XA0
		Firmware for Siemens ASIC DPC 31 <ul style="list-style-type: none"> • DPV1 firmware 	6ES7195-2BB00-0XA0

Overview


- PC slave board IM 182-1 for the connection of AT-compatible PCs as DP slaves

Technical specifications

Article number	6ES7182-0AA01-0XA0 IM 182-1 PC SLAVE BOARD F. PROFIBUS DP
Product type designation	
General information	
Application/function	Slave applications
ASIC	SPC 3
• Scope of firmware	4 to 24 KB (incl. test program)
Supply voltage	
Rated value (DC)	
• 5 V DC	Yes
Input current	
Current consumption, typ.	250 mA
Processor	
Microprocessor type	Processor of the PG/PC

Article number	6ES7182-0AA01-0XA0 IM 182-1 PC SLAVE BOARD F. PROFIBUS DP
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s
Protocols	
PROFIBUS DP	Yes
Ambient conditions	
Ambient temperature in operation	
• Min.	0 °C
• max.	60 °C
Dimensions	
Width	168 mm
Height	105 mm

Ordering data

Ordering data	Article No.
SIMATIC S5/S7 IM 182-1 PC slave board	6ES7182-0AA01-0XA0
For PROFIBUS DP, max. 12 Mbit/s	

Accessories	Article No.
Firmware for Siemens ASIC SPC 3 and IM 182-1	
• DP firmware	6ES7195-2BA00-0XA0
• DPV1 firmware	6ES7195-2BA01-0XA0
• DPV1 firmware upgrade	6ES7195-2BA02-0XA0

I/O systems

SIPLUS PROFIBUS components for ET 200

SIPLUS diagnostics repeater for PROFIBUS

Overview



- RS 485 repeater with online line diagnostics for PROFIBUS DP
- PROFIBUS DP standard slave (DP-V1)
- Automatic determination of fault type and location
- Transmission rate from 9.6 kbit/s to 12 Mbit/s
- Connection via FastConnect IDC

Note:

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

SIPLUS diagnostics repeater for PROFIBUS DP

Article No. 6AG1972-0AB01-4XA0

BasedOn Article No. 6ES7972-0AB01-0AA0

Ambient temperature range	0 °C ... +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	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Ordering data

SIPLUS RS 485 diagnostics repeater

For connecting up to 2 segments to PROFIBUS DP, with on-line diagnostics functions for monitoring the bus lines

Exposure to media

6AG1972-0AB01-4XA0

Accessories

RS 485 bus connector with 90° cable outlet

Max. transfer rate 12 Mbit/s

Extended temperature range and exposure to media

- without PG interface
- with PG interface

6AG1972-0BA12-2XA0
6AG1972-0BB12-2XA0

RS 485 bus connector with angled cable outlet

(Extended temperature range -40°C ... +70°C and medial exposure)

Max. transfer rate 12 Mbit/s

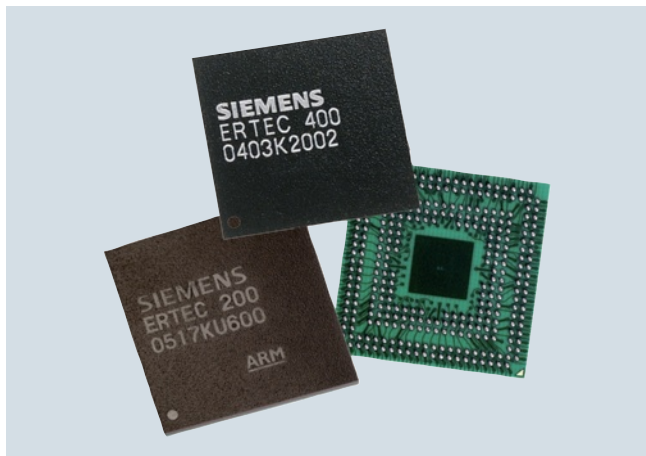
- without PG interface
- with PG interface

6AG1972-0BA42-7XA0
6AG1972-0BB42-7XA0

Additional accessories

See SIMATIC RS 485 diagnostics repeater, page 9/476

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 with Real-Time (RT) and Isochronous Real-Time (IRT) and thus offload the application processor. Thanks to the integral 2-port switch (ERTEC 200 and ERTEC 200P) 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 200P
with an integral 2-port switch and maximum performance for compact and modular PROFINET field devices. The ERTEC 200P is designed for cycle times up to 31.25 μ s. In conjunction with a high-speed ARM 926 CPU, it meets all the requirements for powerful PROFINET implementation.
- ERTEC 200
with an integral 2-port switch for developing compact or modular PROFINET field devices.
- ERTEC 400
with 4 integral ports and one integral PCI interface for developing network components and field devices with specific requirements regarding communication capabilities.

The EK-ERTEC 200P PN IO, 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.

Technical specifications

	ERTEC 400	ERTEC 200	ERTEC 200P
Transmission rate	10/100 Mbit/s	10/100 Mbit/s	100 Mbit/s
Interfaces			
• Ethernet / PHY interface	4 x PHY interface	2 x Ethernet interface (PHY integrated) or alternatively 2 x PHY interface (for connection of optical PHYs)	2 x Ethernet interface (PHY integrated) or alternatively 2 x PHY interface (for connection of optical PHYs)
- In connection with the corresponding PHY types:	• Half/full duplex Support for copper and fiber-optic cables; autosensing; autocrossover	• Half/full duplex Support for copper and fiber-optic cables (PHY for copper integrated); autosensing; autocrossover	Half/full duplex Support for copper and fiber-optic cables (PHY for copper integrated); autosensing; autocrossover
• Local Bus Unit (LBU)	Local bus master interface for connecting an external host with access to internal areas of the ERTEC; 16 bit data bit width	Local bus master interface for connecting an external host with access to internal areas of the ERTEC; 16 bit data bit width	XHIG (external host interface); 16/32 bit data bit width
• External memory interface (EMIF)			
- SDRAM controller	128 MB/16 bit or 256 MB/32 bit	64 MB/16 bit or 128 MB/32 bit	128 MB/16 bit or 256 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)	4 x 16 MB for asynchronous blocks (SRAM, flash, I/O 8/16/32 bit)
- Chip-select support	yes	yes	yes
• IO interfaces	32 parameterizable I/O (GPIO); multifunctional outputs	45 parameterizable I/O (GPIO); multifunctional outputs	up to 96 parameterizable I/O (GPIO); multifunctional outputs
• Intelligent switching and PROFINET IRT prioritization/timing	yes	yes	yes
ARM processor			
• Integral ARM946 processor	32-bit ARM system	32-bit ARM system	32-bit ARM system
- Adjustable operating frequency	50/100/150 MHz	50/100/150 MHz	125/250 MHz

I/O systems

PROFINET components

Enhanced Real-Time Ethernet Controllers ERTEC

Technical specifications (continued)

	ERTEC 400	ERTEC 200	ERTEC 200P
Supply voltage			
• Core (VDD Core)	1.5 V +/- 10 %	1.5 V +/- 10 %	1.2 V +5%/-0.1 V
• I/Os (VDD IO)	3.3 V +/- 10 %	3.3 V +/- 10 %	3.3 V +5%/-10%
• External host interface (XHIF)	-	-	1.8 V +5%/-10%
• PHY	-	-	1.5 V +5%/-10%
• External host interface (XHIF)	-	-	1.8 V/3.3 V +5%/-10%
Perm. ambient conditions			
• Operating temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
• Transport/storage temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
• Relative humidity	Max. 95 % at +25 °C	Max. 95 % at +25 °C	Max. 95 % at +25 °C
Constructional design			
• Housing	Plastic FBGA 304 Pin	Plastic FBGA 304 Pin	Plastic FBGA 400 Pin
• Pinning Ball Pitch	0.8 mm	0.8 mm	0.8 mm
Dimensions (W x H x D) in mm	19 x 1 x 19	19 x 1 x 19	17 x 1 x 17
- ERTEC			
Supported communications protocols			
• General Ethernet protocols	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	In accordance with the respective software implementation that uses the ERTEC as Ethernet controller
• PROFINET in combination with a PROFINET Software Stack	Real-Time communication (RT); Isochronous Real-Time communication (IRT)	Real-Time communication (RT); Isochronous Real-Time communication (IRT)	Real-Time communication (RT); Isochronous Real-Time communication (IRT)

Ordering data**Article No.****Article No.****ERTEC 200P**

ASIC for connection to Switched Ethernet 100 Mbit/s, Ethernet controller with integral 2-port switch, ARM 926 processor and integral PHYs

- 10 units (Evaluation Pack)
- 90 units (single tray)
- 450 units (drypack, 5 trays)

6ES7195-0BH00-0XA0
6ES7195-0BH10-0XA0
6ES7195-0BH20-0XA0

**Evaluation Kit
EK-ERTEC 200P PN IO**

6ES7195-3BE00-0YA0

ERTEC 200

ASIC ERTEC 200 for connection to Switched Ethernet 10/100 Mbit/s, Ethernet controller with integral 2-port switch, ARM 946 processor and integral PHYs

- 70 units (single tray),
- 350 units (drypack, 5 trays),
- 3500 units (package, 10 drypacks)

6GK1182-0BB01-0AA1
6GK1182-0BB01-0AA2
6GK1182-0BB01-0AA3

**Evaluation Kit
EK-ERTEC 200 PN IO**

6ES7195-3BG00-0YA0

ERTEC 400

ASIC ERTEC 400 for connection to switched Ethernet 10/100 Mbit/s, Ethernet controller with integrated 4-port switch, ARM 946 processor and PCI interface (V2.2), data preparation for real-time and isochronous real-time for PROFINET IO

- 70 units (single tray),
- 350 units (drypack, 5 trays)

6GK1184-0BB01-0AA1
6GK1184-0BB01-0AA2

**Evaluation Kit
DK-ERTEC 400 PN IO**

6ES7195-3BH00-0YA0

Overview



With the development packages for PROFINET, compact or modular PROFINET field devices can be developed quickly and with little effort. Depending on the application, different development packages are available.

The development packages for the ASICs of the ERTEC family (Enhanced Real-Time Ethernet Controller) are suitable for the development of field devices with an integrated IRT switch (Isochronous Real-Time). The demand for real-time capability, linear topology capability, and for IT integration is therefore met perfectly.

With the help of the development package for standard Ethernet controllers, PROFINET devices can be developed on the basis of a standard Ethernet controller. Devices with RT (Real-Time) can be implemented in the field device without special hardware.

The PROFIsafe StarterKit permits the implementation of fail-safe devices. In so doing, the PROFIsafe Stack applicatively builds on the PROFINET stack.

Ordering data

Article No.

Article No.

ERTEC development kits / evaluation kits

Evaluation Kit EK-ERTEC 200P PN IO	6ES7195-3BE00-0YA0
Evaluation kit EK-ERTEC 200 PN IO	6ES7195-3BG00-0YA0
Evaluation kit DK-ERTEC 400 PN IO	6ES7195-3BH00-0YA0
Development kit for standard Ethernet controller	6ES7195-3BC00-0YA0
PROFIsafe starter kit V3.4	6ES7195-3BF02-0YA0

ERTEC ASICs**ERTEC 200P**

ASIC for connection to Switched Ethernet 100 Mbit/s, Ethernet controller with integral 2-port switch, ARM 926 processor and integral PHYs	
<ul style="list-style-type: none"> • 10 units (Evaluation Pack) • 90 units (single tray) • 450 units (drypack, 5 trays) 	6ES7195-0BH00-0XA0 6ES7195-0BH10-0XA0 6ES7195-0BH20-0XA0

ERTEC 200

ASIC ERTEC 200 for connection to Switched Ethernet 10/100 Mbit/s, Ethernet controller with integral 2-port switch, ARM 946 processor and integral PHYs	
<ul style="list-style-type: none"> • 70 units (single trays) • 350 units (drypack, 5 trays) • 3500 units (package, 10 drypacks) 	6GK1182-0BB01-0AA1 6GK1182-0BB01-0AA2 6GK1182-0BB01-0AA3

ERTEC 400

ASIC ERTEC 400 for connection to Switched Ethernet 10/100 Mbit/s, Ethernet controller with integral 4-port switch, ARM 946 processor and PCI interface (V2.2)	
<ul style="list-style-type: none"> • 70 units (single trays) • 350 units (drypack, 5 trays) 	6GK1184-0BB01-0AA1 6GK1184-0BB01-0AA2

Accessories

PROFINET IO product line license for one product line	6ES7195-3BC10-0YA0
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I/O systems

PROFINET components

PROFINET Driver**Overview**

- For connecting distributed I/O and drives to user-specific control applications via PROFINET
- Operation of the control software on a standard PC using the standard Ethernet interface of the PC
- Supplied as portable source code and can therefore be used with any operating system
- Sample application for Windows included in the scope of delivery; uses SIMATIC IPCs as example hardware

Ordering data**PROFINET Driver**

For connecting distributed I/O and drives to user-specific control applications via PROFINET

Development license

Runtime licenses

- 10 units
- 50 units
- 200 units
- 500 units

Article No.

6ES7195-3AA00-0YA0

6ES7195-3AA10-0XA0

6ES7195-3AA20-0XA0

6ES7195-3AA30-0XA0

6ES7195-3AA40-0XA0

Overview



- Terminates bus segments at data transmission rates of 9.6 kbit/s to 12 Mbit/s
- Power supply independent of bus station

Designed for Industry

- Terminal-independent bus termination through onboard power supply

Technical specifications

Article number	6ES7972-0DA00-0AA0 RS485 TERM. RESISTOR F. PROFIBUS/MPI
Product type designation	
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, typ.	30 mA
Power losses	
Power loss, max.	0.72 W
Interfaces	
Bus cables	Screw terminal block
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
Degree of protection to EN 60529	
• IP20	Yes

Article number	6ES7972-0DA00-0AA0 RS485 TERM. RESISTOR F. PROFIBUS/MPI
Ambient conditions	
Ambient temperature in operation	
• Min.	0 °C
• max.	60 °C
Storage/transport temperature	
• Min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at +25 °C
Connection method	
Power supply	Screw terminal block
Dimensions	
Width	60 mm
Height	70 mm
Depth	43 mm
Weights	
Weight, approx.	95 g

Ordering data

Article No.

Active RS 485 terminating element for PROFIBUS

For terminating bus segments for transmission rates of 9.6 kbit/s to 12 Mbit/s

6ES7972-0DA00-0AA0

I/O systems

Network components for PROFIBUS

Repeater RS 485 for PROFIBUS

Overview



- Automatic detection of transmission rates
- Transmission rates from 9.6 kbit/s to 12 Mbit/s are possible, incl. 45.45 kbit/s
- 24 V DC voltage display
- Indication of bus activity segment 1 and 2
- The separation of segment 1 and segment 2 by means of switches is possible
- Separation of the right segment with an inserted terminating resistor
- Decoupling of segment 1 and segment 2 in the case of static interference

Designed for Industry

- For increasing the expansion
- Electrical isolation of segments
- Commissioning support
 - Switches for separation of segments
 - Bus activity display
 - Segment separation in the case of an incorrectly inserted terminating resistor

In this context, please also note the diagnostics repeater that provides extensive diagnostics functions for physical line diagnostics in addition to the normal repeater functionality. This is described on page 9/475.

Technical specifications

Article number	6ES7972-0AA02-0XA0 REPEATER RS485 F. PROFIBUS/MPI
Product type designation	
Supply voltage	
Rated value (DC)	Yes
• 24 V DC	20.4 V
permissible range, lower limit (DC)	28.8 V
permissible range, upper limit (DC)	
Input current	
Current consumption, max.	100 mA; 100 mA without loads at PG/OP socket; 130 mA load at PG/OP socket (5 V/90 mA); 200 mA load at PG/OP socket (24 V/100 mA)
Interfaces	
Bus cables	2 terminal blocks
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
Degree of protection to EN 60529	Yes
• IP20	
Ambient conditions	
Ambient temperature in operation	
• Min.	0 °C
• max.	60 °C
Storage/transport temperature	
• Min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at 25 °C
Connection method	
Power supply	Terminal block
Dimensions	
Width	45 mm
Height	128 mm
Depth	67 mm
Weights	
Weight, approx.	350 g

Ordering data

Article No.

RS 485 repeater for PROFIBUS **6ES7972-0AA02-0XA0**

Transfer rate up to max. 12 Mbit/s,
24 V DC, enclosure IP20

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 SIMATIC 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

Article No.	6AG1972-0DA00-2AA0
Based on Article No.	6ES7972-0DA00-0AA0
Ambient temperature range	-25 °C ... +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	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080...795 hPa (-1 000 ... +2 000 m) See ambient temperature range 795...658 hPa (+2,000 ... +3,500 m) Derating 10 K 658...540 hPa (+3 500 ... +5 000m) Derating 20K

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Ordering data**Article No.****SIPLUS active RS 485 terminating element for PROFIBUS**

To complete bus segments for transmission rates of 9.6 kbit/s to 12 Mbit/s

Extended temperature range and exposure to media

6AG1972-0DA00-2AA0

Accessories

See SIMATIC active RS 485 terminating element for PROFIBUS, page 9/485

I/O systems

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
- Electrical isolation of segments
- Commissioning support
 - Segment separation switch
 - Bus activity display
 - Segment separation with an incorrectly inserted terminator

Please also note in this context the diagnostics repeater that provides extensive diagnostics functions for physical line diagnostics in addition to the normal repeater functionality. This is described on page 9/480.

Note:

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

For further technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1972-0AA02-7XA0
Based on	6ES7972-0AA02-0XA0 SIPLUS DP RS485-REPEATER
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C
• max.	70 °C
Storage/transport temperature	
• Min.	-40 °C
• max.	70 °C
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data

SIPLUS RS 485 repeater for PROFIBUS

Transfer rate up to max. 12 Mbit/s, 24 V DC, enclosure IP20

Extended temperature range and exposure to media

Accessories

Article No.

6AG1972-0AA02-7XA0

See SIMATIC RS 485 repeater for PROFIBUS, page 9/486

Overview



- Maximum data exchange of 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
- ReturnOfSubmodule interrupts

Ordering data

Article 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

6ES7193-4JB00-0AA0
6ES7193-4JB50-0AA0

I/O systems

Network transitions

DP/DP coupler**Overview**

- For 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 coupler	
PROFIBUS transmission rate	max. 12 Mbit/s
Interfaces	• PROFIBUS DP
Supply voltage	24 V DC
Current consumption typ.	150 mA
Mounting	Upright (DIP switches above)
Perm. environmental 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**Article No.**

DP/DP coupler	6ES7158-0AD01-0XA0
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Note:

The manual is available free on the Internet.