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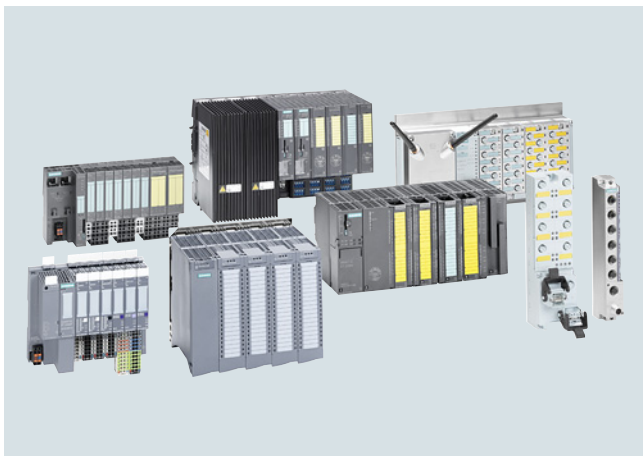
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Overview

**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 is 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. This makes the AS-Interface the ideal partner for PROFINET and PROFIBUS DP. AS-i communication modules in the ET 200SP enable the flexible combination of AS-Interface and distributed I/Os. AS-Interface transmits standard data and safety data up to PL e / SIL 3 in the same AS-i network. AS-Interface is not only suitable for efficient transmission of digital and analog I/O signals but also ideal for the user-friendly connection of EMERGENCY STOP pushbuttons and protective doors.

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 power management

I/O Systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

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 an interface module 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 Controller). ET 200SP components are available as SIPLUS version for extreme requirements and a high degree of robustness.

For ET 200SP, a comprehensive range of I/O modules, including fail-safe versions, is available:

- Digital input modules (DI), with color coding white
- Digital output modules (DQ), with color coding black
- Analog input modules (AI), with color coding light blue
- Analog output modules (AQ), with color coding dark blue
- Technology modules (TM), with color coding turquoise
- Communication modules (CM), with color coding light gray
- Special modules, with color coding mint green
- Motor starters as direct on-line starters (DS) and reversing starters (RS)
- Pneumatics

Apart from the standard type of delivery as an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

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
- Startup and operation with slot gaps (free spaces)

Flexible connection system

- Push-in terminals for cross-sections up to 1.5 mm² with wire end ferrule, and up to 2.5 mm² without wire end ferrule
- BaseUnits for 1-wire or direct multi-wire connection
- PotDis module for system-integrated and space-saving provision of additional potential terminals
- Optimum accessibility for wiring due to spring release and measuring tap next to the conductor opening
- Flexible PROFINET connection via BusAdapter (RJ45, FastConnect, plastic or glass fiber-optic cables), 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-fail-safe modules

High performance

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

High-performance technology

- Modules for the functions Counting, Positioning, Weighing, Output cams, PWM, Force measurement, etc.

Energy efficiency

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

Advanced functions

- Configuration control: application-based adaptation of the actual configuration via user software (option handling)
- Time-based IO: time stamping of the signals to the μ s
- MSI/MSO: Simultaneous access to I/O data from up to 4 PLCs
- MtM: Direct data exchange between IO modules (**Module-to-Module** communication)
- Oversampling: n-fold acquisition or output of digital and analog signals within a PN cycle
- Adaptation of measuring range: increased resolution by adapting the measuring range to a limited section of a measuring range supported by the analog input module
- Scaling of measured values: permits the transmission of the analog value normalized to the required physical value as a REAL value (32-bit floating point)

Overview (continued)Communication standards

- PROFINET IO
- PROFIBUS DP V0/V1
- ET connection for connecting the ET 200AL (IP67)
- IO-Link V1.1
- AS-Interface
- Modbus TCP
- Point-to-point (RS 232, RS 485, RS 422)
- Freeport
- 3964(R)
- USS
- Modbus RTU (master/slave)

CPU

- PROFINET connection with 3 ports
- IO controller and PN IO device
- Optional expansion as DP master/slave
- Also as fail-safe version and Open Controller

Overview of ET 200SP components

Basic components	Function
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 stand-alone 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

Labeling of I/O modules

- Meaningful labeling on the front of the I/O modules
 - Module type in plain text including function class, e.g. "DI 8x24VDC HF"
 - Article No.
 - 2D matrix code with article and serial number (with call via the "Industry Online Support" app, direct link to the support page of the module)
 - Hardware functional status and firmware version
 - Suitable BU type for the respective I/O module
 - Color code of the suitable color-coding plate
 - Connection diagram
- Optionally expandable with
 - Labeling strips
 - Equipment labeling plate

Basic components	Function
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
SIMATIC BusAdapter (BA)	<p>SIMATIC BusAdapters permit the free selection of the connection method and connection technology for head-end stations with PROFINET interface.</p> <p>Various versions are available for the connection of copper cables or plastic and glass fiber-optic cables. Hybrid copper/fiber-optic versions are also available as integrated media converters.</p> <p>Cable length between 2 stations: max. 100 m (Cu), max. 50 m (POF), max. 100 m (PCF), max. 3 km (multi-mode glass FOC).</p> <p>For expanding the station with the I/O system ET 200AL via ET connection, the BA-Send BusAdapter is available.</p>

I/O Systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Overview (continued)

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"> • Light 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 (single or direct multi-conductor connection) 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
Potential distributor modules (PotDis BU, PotDis TB)	<p>With the potential distributor modules for the SIMATIC ET 200SP, additional potentials required within an ET 200SP station can be set up quickly and in a space-saving manner. Due to the free combinability of PotDis BUs and PotDis TBs, the potential distributor modules allow a variety of design variants and thus simple adaptation to individual needs. Within the station, existing potentials can be multiplied or even new potential groups can be formed. With 36 terminals per 15 mm width, the PotDis modules require very little space without compromising on the conductor cross-sections (maximum 2.5 mm²). They allow the connection of voltages up to 48 V DC with a maximum current carrying capacity of 10 A, and with the PotDis TB-BR-W even up to 230 V AC/10 A as well as the possibility to connect a protective conductor.</p>
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 modules 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) • DQ (digital output) • AI (analog input) • AQ (analog output) • TM (technology modules) • CM (communication modules) • SM (special modules)

Basic components	Function
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 the BU cover, an equipment labeling plate can be kept for the possible later use of an I/O module.</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 supply of all head-end stations.</p>
Standard rail according to EN 60715	<p>The standard rail is the module support of the ET 200SP. The ET 200SP is mounted on the standard rail.</p>
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
System-integrated 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 cables by means of the shield connection element and short, unshielded cable lengths • Low space requirements

Overview (continued)

Basic components	Function	Basic components	Function
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, card 180 g/mm², perforated, for printing with a laser printer direct from TIA Portal or via print templates 	Color-coded labels	<p>The I/O modules that are plugged onto the BaseUnits determine the potentials connected at the push-in terminals. The +/- potentials can optionally be identified using module-specific color-coded labels. The potentials of the AUX and add-on terminals as well as potential distributor modules can also be marked using color-coded labels. Color-coded labels are supplied in packs of 10 or 50 labels. Advantages of the color-coded labels:</p> <ul style="list-style-type: none"> • Quick installation (one label for marking up to 16 terminals) • Avoidance of wiring errors • Simple detection of potentials during servicing
Equipment labeling plate	<p>Optionally, one equipment labeling plate each can be plugged onto head-end stations, BusAdapters, BaseUnits, potential distributor modules (PotDis BU and PotDis TB), 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 or plotters, 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>		

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Interface modules > IM 155-6

Overview



Thanks to their wide scope of functions, the interface modules of the scalable SIMATIC ET 200SP I/O system, even in their basic versions, cover a wide range of applications. The basic functions of the interface modules include:

- Short data update times of typically 1 ms
- Single Hot Swap (withdrawing and insertion of an I/O module during operation without impairing the communication with the remaining modules)
- Operation with gaps (empty BaseUnits)
- Complete diagnostic support, extending to channel-by-channel diagnostics
- Configuration control / option handling (adaptation of the actual configuration via user software)
- Device replacement without PG, with automatic re-initialization, with and without topological configuring
- I&M data 0 to 3 (electronic rating plate with non-volatile storage of plant data)
- Firmware update
- Pluggable 24 V DC supply connection
- Mains/voltage failure buffering time of at least 5 ms or 10 ms
- Labeling option via optional labeling strips and equipment labeling plates

When using PROFINET interface modules, the following basic functions are also included:

- Media redundancy (MRP)
- Integrated 2-port switch
- Freely selectable connection system (Standard function class and above) and physical connection (High Feature function class and above) by means of SIMATIC BusAdapters, also as system-integrated media converter from fiber-optic to copper cable
- Reset button for simple return to factory settings without the need for programming device
- Automatic synchronization of the backplane bus to the PROFINET cycle to minimize the response time fluctuations (jitter)

Listed below is a short overview of the interface modules available for the ET 200SP, showing the essential differences. An up-to-date, clear and more precise comparison of functions of the different interface modules is offered by the TIA Selection Tool.

SIMATIC IM155-6DP High Feature with PROFIBUS connection

- Max. 32 I/O modules, also PROFIsafe modules with complete diagnostic support.
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 244 bytes in each case for input and output data per module and per station
- Data update time: typ. 5 ms
- PROFIBUS connection via 9-pin sub D socket
- Package includes server module and PROFIBUS connector with programming device socket

SIMATIC IM155-6PN Basic with PROFINET access

- Max. 12 I/O modules, no PROFIsafe modules, with complete diagnostic support
- Max. 32 bytes in each case for input and output data per module and per station
- Data update time: typ. 1 ms
- PROFINET connection via 2 integrated RJ45 sockets (integrated 2-port switch)
- Package includes server module

SIMATIC IM 155-6PN Standard with a PROFINET interface for SIMATIC BusAdapters

- Two types of delivery:
 - As package with IM155-6PN ST, with pre-assembled BA 2xRJ45 BusAdapter, including server module
 - As package with IM155-6PN ST, without BusAdapter, including server module
- Max. 32 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 256 bytes in each case for input and output data per module and max. 512 bytes per station (depending on configuration)
- Data update time: typ. 1 ms
- Selection of the type of connection of the PROFINET by means of SIMATIC BusAdapter (BusAdapter for copper cables only)

SIMATIC IM155-6PN/2 High Feature, 2-port IM with one slot for SIMATIC BusAdapter

- Max. 64 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 288 bytes in each case for input and output data per module and max. 1440 bytes per station (depending on configuration)
- Fast data refresh time from 250 µs, also in isochronous mode
- S2 system redundancy
- Choice of connection type and physical connection of the PROFINET by means of SIMATIC BusAdapter. All BusAdapters with a connection for copper and/or fiber-optic cables can be used; BusAdapter must be ordered separately
- Package includes server module

Overview (continued)SIMATIC IM155-6PN/3 High Feature, 3-port IM with two slots for SIMATIC BusAdapter

Additional functions compared to 2-port High Feature IM:

- Second slot for SIMATIC BusAdapter, max. 3 ports can be used
- Local IO data coupling between up to 4 controllers

SIMATIC IM 155-6PN High Speed with a PROFINET interface for SIMATIC BusAdapters

- Max. 30 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Max. 32 bytes in each case for input and output data per module and max. 968 bytes per station (depending on configuration)
- Fast refresh data time: from 125 µs, even in isochronous mode
- Performance upgrade for PROFINET
- Choice of connection type and physical connection of the PROFINET by means of SIMATIC BusAdapter. All BusAdapters with a connection for copper and/or fiber-optic cables can be used; BusAdapter must be ordered separately
- Package includes server module

Technical specifications

Article number	6ES7155-6AR00-0AN0 ET 200SP, IM155-6PN Basic	6ES7155-6AA01-0BNO ET 200SP, IM155-6PN ST incl. BA 2xRJ45	6ES7155-6AU01-0BNO ET 200SP, IM155-6PN ST
General information			
Product type designation	IM 155-6 PN BA	IM 155-6 PN ST	IM 155-6 PN ST
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes; Single hot swapping	Yes; Single hot swapping	Yes; Single hot swapping
Engineering with			
• STEP 7 TIA Portal configurable/integrated as of version	V13 SP1	V14	V14
• STEP 7 configurable/integrated as of version	V5.5 SP4 and higher	V5.5 SP4 and higher	V5.5 SP4 and higher
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Short-circuit protection		Yes	Yes
Input current			
Current consumption (rated value)		450 mA	450 mA
Power loss			
Power loss, typ.	1.8 W	1.9 W	1.9 W
Address area			
Address space per station			
• Address space per station, max.	32 byte; per input / output	512 byte; Dependent on configuration	512 byte; Dependent on configuration
Hardware configuration			
Rack			
• Modules per rack, max.	12	32; + 16 ET 200AL modules	32; + 16 ET 200AL modules
Submodules			
• Number of submodules per station, max.		256	256
Interfaces			
Number of PROFINET interfaces	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)
1. Interface			
Interface types			
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
• RJ 45 (Ethernet)	Yes; 2 integrated RJ45 ports	Yes; Pre-assembled BusAdapter BA 2x RJ45	
• BusAdapter (PROFINET)	No	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Interface modules > IM 155-6

Technical specifications (continued)

Article number	6ES7155-6AR00-0AN0 ET 200SP, IM155-6PN Basic	6ES7155-6AA01-0BNO ET 200SP, IM155-6PN ST incl. BA 2xRJ45	6ES7155-6AU01-0BNO ET 200SP, IM155-6PN ST
Protocols			
• PROFINET IO Device	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Media redundancy	Yes; PROFINET MRP	Yes; PROFINET MRP	Yes; PROFINET MRP
Interface types			
RJ 45 (Ethernet)			
• 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)
• 10 Mbps	No	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)
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
Protocols			
PROFINET IO Device			
Services			
- Isochronous mode	No	No	No
- Open IE communication	Yes	Yes	Yes
- IRT	No	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
- PROFinergy	No	Yes	Yes
- Prioritized startup	No	Yes	Yes
- Shared device	No	Yes	Yes
- Number of IO Controllers with shared device, max.		2	2
Redundancy mode			
• MRP	Yes	Yes	Yes
• MRPD	No	No	No
• PROFINET system redundancy (S2)	No	No	No
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• SNMP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	No	No	No
Equidistance	No		
Interrupts/diagnostics/status information			
Status indicator	Yes	Yes	Yes
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
Diagnostics indication LED			
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• MAINT LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green LED		
• Connection to network LINK (green)		Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter
Standards, approvals, certificates			
Network loading class	2	2	2
Security level		According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1

Technical specifications (continued)

Article number	6ES7155-6AR00-0AN0 ET 200SP, IM155-6PN Basic	6ES7155-6AA01-0BN0 ET 200SP, IM155-6PN ST incl. BA 2xRJ45	6ES7155-6AU01-0BN0 ET 200SP, IM155-6PN ST		
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	0 °C	0 °C	0 °C		
• horizontal installation, max.	60 °C	60 °C	60 °C		
• vertical installation, min.	0 °C	0 °C	0 °C		
• vertical installation, max.	50 °C	50 °C	50 °C		
Dimensions					
Width	35 mm	50 mm	50 mm		
Height	117 mm	117 mm	117 mm		
Depth	74 mm	74 mm	74 mm		
Weights					
Weight, approx.	125 g	190 g; IM 155-6 PN BA with 2x RJ45 ports and server module	147 g; without BusAdapter		
Article number	6ES7155-6AU01-0CN0 ET 200SP, IM155-6PN/2 HF	6ES7155-6AU30-0CN0 ET 200SP, IM155-6PN/3 HF	6ES7155-6AU00-0DN0 ET 200SP, IM155-6PN HS	6ES7155-6BA01-0CN0 ET 200SP, IM155-6DP HF incl. DP-Connect.	
General information					
Product type designation	IM 155-6 PN/2 HF with server module	IM 155-6 PN/3 HF with server module	IM 155-6 PN HS	IM 155-6DP HF with PROFIBUS connector and server module	
Number of MtM communication relationships/connections, max.	16	16			
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	
• Module swapping during operation (hot swapping)	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping	
• Tool changer	Yes; Docking station and docking unit	Yes; Docking station and docking unit			
• Local coupling, IO data	No	Yes			
- Number of coupling modules		16			
- Number of coupling submodules per module		4			
• Local coupling, data records	No	No			
Engineering with					
• STEP 7 TIA Portal configurable/integrated as of version	STEP 7 V15.1 or higher	V15.1	STEP 7 V14 or higher	V15 SP1	
• STEP 7 configurable/integrated as of version	Configurable via GSD file	Configurable via GSD file	V5.5 SP4 and higher	As of V5.5 SP4, only up to FW V3.1	
• PROFIBUS as of GSD version/GSD revision				One GSD file each, Revision 3 and 5 and higher	
• PROFINET as of GSD version/GSD revision	GSDML V2.3	GSDML V2.3	- / V2.3		
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	
Reverse polarity protection	Yes	Yes	Yes	Yes	
Input current					
Current consumption (rated value)		175 mA; At 24 V, 2 slots 2x RJ45 BusAdapter, no I/O modules			
Power loss					
Power loss, typ.	2.4 W	4.9 W	1.7 W	1.5 W	
Address area					
Address space per station					
• Address space per station, max.	1 440 byte; Dependent on configuration	1 440 byte; Dependent on configuration	968 byte; For input and output data respectively	244 byte; per input / output	
Hardware configuration					
Rack					
• Modules per rack, max.	64; + 16 ET 200AL modules	64; + 16 ET 200AL modules	30	32; + 16 ET 200AL modules	
Submodules					
• Number of submodules per station, max.	256	256	125		

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Interface modules > IM 155-6

Technical specifications (continued)

Article number	6ES7155-6AU01-0CNO ET 200SP, IM155-6PN/2 HF	6ES7155-6AU30-0CNO ET 200SP, IM155-6PN/3 HF	6ES7155-6AU00-0DNO ET 200SP, IM155-6PN HS	6ES7155-6BA01-0CNO ET 200SP, IM155-6DP HF incl. DP-Connect.
Time stamping				
Accuracy	10 ms			
Interfaces				
Number of PROFINET interfaces	1; 2 ports (switch)	1; 3 ports (switch)	1; 2 ports (switch)	
Number of PROFIBUS interfaces				1
1. Interface				
Interface types				
• Number of ports	2; via BusAdapter	3; Via 2 BusAdapter slots	2	
• integrated switch	Yes	Yes	Yes	
• RS 485				Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC	
• Output current of the interface, max.				90 mA
Protocols				
• PROFINET IO Device	Yes	Yes	Yes	
• PROFIBUS DP slave				Yes
• Open IE communication	Yes	Yes	Yes	
• Media redundancy	Yes; PROFINET MRP	Yes; PROFINET MRP	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring	
Interface types				
RJ 45 (Ethernet)				
• 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)	
• 10 Mbps	No	No	No	
• 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)	
• Autonegotiation	Yes	Yes	Yes	
• Autocrossing	Yes	Yes	Yes	
RS 485				
• Transmission rate, max.				12 Mbit/s
Protocols				
PROFINET IO Device				
Services				
- Isochronous mode	Yes; Bus cycle time: min. 250 µs	Yes; Bus cycle time: min. 250 µs	Yes; Bus cycle time: min. 125 µs	
- Open IE communication	Yes	Yes	Yes	
- IRT	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	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	Yes; 125 µs, 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	
- PROFInergy	Yes	Yes	Yes	
- Prioritized startup	Yes	Yes	Yes	
- Shared device	Yes	Yes	Yes	
- Number of IO Controllers with shared device, max.	4	4	4	

Technical specifications (continued)

Article number	6ES7155-6AU01-0CN0 ET 200SP, IM155-6PN/2 HF	6ES7155-6AU30-0CN0 ET 200SP, IM155-6PN/3 HF	6ES7155-6AU00-0DN0 ET 200SP, IM155-6PN HS	6ES7155-6BA01-0CN0 ET 200SP, IM155-6DP HF incl. DP-Connect.
Redundancy mode				
• MRP	Yes	Yes	Yes	
• MRPD	No	No	Yes	
• PROFINET system redundancy (S2)	Yes; NAP S2	Yes; NAP S2	No	
• Redundant PROFINET configuration (R1)	No	No		
• H-Sync forwarding	Yes	Yes		
Open IE communication				
• TCP/IP	Yes	Yes	Yes	
• SNMP	Yes	Yes	Yes	
• LLDP	Yes	Yes	Yes	
PROFIBUS DP				
Services				
- SYNC capability				Yes
- FREEZE capability				Yes
- DPV0				Yes
- DPV1				Yes
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	Yes	Yes	Yes	No
Equidistance	Yes	Yes	Yes	
shortest clock pulse	250 µs	250 µs	125 µs	
max. cycle	4 ms	4 ms	4 ms	
Bus cycle time (TDP), min.	250 µs	250 µs	125 µs	
Interrupts/diagnostics/ status information				
Status indicator	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	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 PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Connection display DP				Yes; Green DP LED
• Connection to network LINK (green)	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	
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 during operation				
• horizontal installation, min.	-30 °C; No condensation	-30 °C; No condensation	0 °C	-25 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; No condensation	-30 °C; No condensation	0 °C	-25 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m		2 000 m; On request: Installation altitudes greater than 2 000 m
Mechanics/material				
Strain relief	Yes; Optional	Yes; Optional		
Dimensions				
Width	50 mm	100 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.	120 g; without BusAdapter	220 g; without BusAdapter	147 g; without BusAdapter	150 g

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Interface modules > IM 155-6

Ordering data	Article No.	Ordering data	Article No.
IM155-6PN Basic PROFINET interface module With server module; two integrated RJ45 sockets	6ES7155-6AR00-0AN0	SIMATIC BA SCRJ/RJ45 BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	6ES7193-6AP20-0AA0
IM155-6PN Basic PROFINET interface module With server module		SIMATIC BA SCRJ/FC BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	6ES7193-6AP40-0AA0
• With attached SIMATIC BA 2xRJ45 BusAdapter	6ES7155-6AA01-0BN0		
• Without SIMATIC BusAdapter	6ES7155-6AU01-0BN0		
IM155-6PN/2 High Feature PROFINET interface module 2-port IM with server module, without SIMATIC BusAdapter	6ES7155-6AU01-0CN0		
IM155-6PN/3 High Feature PROFINET interface module 3-port IM with server module, without SIMATIC BusAdapter	6ES7155-6AU30-0CN0	SIMATIC BA 2XLC BusAdapter For PROFINET interface modules from High Feature function class or above; with LC fiber-optic connection; for increased vibration and EMC load capacity; max. cable length 2 km	6ES7193-6AG00-0AA0
IM155-6PN High Speed PROFINET interface module With server module, without SIMATIC BusAdapter	6ES7155-6AU00-0DN0	SIMATIC BA LC/RJ45 BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 2 km (glass) or 50 m (copper)	6ES7193-6AG20-0AA0
IM155-6DP High Feature PROFIBUS interface module With server module, with PROFIBUS plug with PG socket	6ES7155-6BA01-0CN0		
Accessories		SIMATIC BA LC/FC BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 2 km (glass) or 50 m (copper)	6ES7193-6AG40-0AA0
Strain relief for the PROFINET cable System-integrated strain relief for High Feature PN interface modules (5 units)	6ES7193-6RA00-1AN0		
SIMATIC BA 2xRJ45 BusAdapter For PROFINET interface modules, standard function class or above; max. cable length 50 m	6ES7193-6AR00-0AA0	Station expansion with IP67 I/O system ET 200AL	
SIMATIC BA 2xFC BusAdapter For PROFINET interface modules, standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	6ES7193-6AF00-0AA0	ET 200SP BA-Send 1 x FC BusAdapter	6ES7193-6AS00-0AA0
SIMATIC BA 2xSCRJ BusAdapter For PROFINET interface modules from High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	6ES7193-6AP00-0AA0	BaseUnit BU-Send	6ES7193-6BN00-0NE0

Ordering data	Article No.	Article No.
Further accessories		SIMATIC Manual Collection
Labeling strips		6ES7998-8XC01-8YE0
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	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
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AA0	
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AG0	SIMATIC Manual Collection update service for 1 year
Equipment labeling plate	6ES7193-6LF30-0AW0	Current "Manual Collection" DVD and the three subsequent updates
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter		Spare parts
Standard rail 35 mm		Server module
Length: 483 mm for 19" cabinets	6ES5710-8MA11	6ES7193-6PA00-0AA0
Length: 530 mm for 600 mm cabinets	6ES5710-8MA21	Terminates an ET 200SP station; included in the scope of supply of the interface modules
Length: 830 mm for 900 mm cabinets	6ES5710-8MA31	Power supply connector for ET 200SP head-end stations (interface module, CPU and open controller)
Length: 2 m	6ES5710-8MA41	For connecting the 24 V DC supply voltage, push-in version; included in scope of supply of the head-end station
Manuals for ET 200SP distributed I/O system		with push-in terminals (10 units) 6ES7193-4JB00-0AA0
SIMATIC ET 200SP Manual Collection: PDF file with the following content:		with screw-type terminals (10 units) 6ES7193-4JB50-0AA0
<ul style="list-style-type: none"> • Basic information System manual, product information, overview tables, correction information or manual supplements • Device-specific information Device manuals for the interface modules, PLC, OC and I/O modules, including fail-safe and motor starters • Comprehensive information Function manuals 		
The Manual Collection can be downloaded from the Internet as a PDF file:		
https://support.industry.siemens.com/cs/ww/en/view/84133942		

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Interface modules > SIPLUS interface modules

Overview



- Interface module for linking the I/O modules to a higher-level controller with PROFINET or PROFIBUS
- Server module included in the scope of supply
- Station expansion with IP67 I/O system ET 200AL via ET-connection to BU-Send / BA-Send
- PROFINET bus connection
 - 2 ports for line configuration
 - PN connection selected via BusAdapter (ST, HF)
 - Two integrated RJ45 sockets (BA)
- PROFIBUS bus connection
 - 9-pin sub D socket
 - PROFIBUS connector included in scope of supply
 - Hot swapping (module replacement during operation)
 - Startup and operation with gaps
 - Dynamic re-parameterization in RUN mode
 - Configuration control (option handling)
 - Pluggable 24 V DC supply connector
 - Electronically readable rating plate (I&M data)

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	6AG1155-6AA01-7BNO	6AG1155-6AU00-2CNO	6AG1155-6AU01-7BNO	6AG1155-6BA00-7CNO
Based on	6ES7155-6AA01-0BNO SIPLUS ET 200SP IM155-6PN ST / BA	6ES7155-6AU00-0CNO SIPLUS ET 200SP IM155-6PN HF	6ES7155-6AU01-0BNO SIPLUS ET 200SP IM155-6PN ST	6ES7155-6BA00-0CNO SIPLUS ET 200SP IM155-6DP HF
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

Technical specifications (continued)

Article number	6AG1155-6AA01-7BN0	6AG1155-6AU00-2CN0	6AG1155-6AU01-7BN0	6AG1155-6BA00-7CN0
Based on	6ES7155-6AA01-0BN0 SIPLUS ET 200SP IM155-6PN ST / BA	6ES7155-6AU00-0CN0 SIPLUS ET 200SP IM155-6PN HF	6ES7155-6AU01-0BN0 SIPLUS ET 200SP IM155-6PN ST	6ES7155-6BA00-0CN0 SIPLUS ET 200SP IM155-6DP HF
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

Article No.	Article No.
SIPLUS PROFINET IM155-6PN Standard interface module (Extended temperature range and exposure to environmental substances) • IM 155-6PN ST, with server module and installed BA 2xRJ45 BusAdapter, plus extended power failure backup time	Accessories See SIMATIC ET 200SP, IM 155-6 interface module, page 9/14
SIPLUS interface module High Feature (Extended temperature range and exposure to environmental substances) • IM 155-6DP HF, with server module, with multi-hot-swap, incl. PROFIBUS connector • IM 155-6PN HF, incl. server module, without BusAdapter • IM 155-6PN HF, including server module, without BusAdapter, plus extended power failure backup time	
6AG1155-6AA01-7BN0	
6AG1155-6BA00-7CN0	
6AG1155-6AU00-2CN0	
6AG1155-6AU01-7BN0	

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital input modules

Overview



- 4, 8 and 16-channel digital input (DI) modules
- Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital input modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DI (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with additional potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)

- Option of connecting sensors compliant with IEC 61131 type 1, 2 or 3 (module-dependent) for rated voltages of up to 24 V DC or 230 V AC
- PNP (sink input) and NPN (source input) versions
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults (e.g. wire break/short-circuit)
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
 - Counting operating mode (multi-channel counter for pulse generators with 32-bit counting width and up to 10 kHz counting frequency)
 - Oversampling operating mode (n-fold equidistant acquisition of digital values within one PN cycle for increasing the time resolution for slow CPU cycles)
 - Parameterizable input delay time
 - Isochronous mode (simultaneous equidistant reading of all input channels)
 - Hardware interrupts
 - Pulse extension
 - Re-parameterization during operation
 - Firmware update
 - Diagnosis of wire break and short-circuit (on channel or module basis)
 - Value status (optional binary validity information of the input signal in the process image)
 - Supports the PROFlenergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shielding terminal

A quick and clear comparison of the functions of the different DI modules is offered by the TIA Selection Tool.

Overview of digital input modules

Digital input	PU	Article No.	CC code	BU type
DI 16 x 24 V DC ST	1	6ES7131-6BH01-0BA0	CC00	A0
DI 16 x 24 V DC ST	10	6ES7131-6BH01-2BA0	CC00	A0
DI 8 x 24 V DC BA	1	6ES7131-6BF01-0AA0	CC01	A0
DI 8 x 24 V DC BA	10	6ES7131-6BF01-2AA0	CC01	A0
DI 8 x 24 V DC SRC BA	1	6ES7131-6BF61-0AA0	CC02	A0
DI 8 x 24 V DC ST	1	6ES7131-6BF01-0BA0	CC01	A0
DI 8 x 24 V DC ST	10	6ES7131-6BF01-2BA0	CC01	A0
DI 8 x 24 V DC HF	1	6ES7131-6BF00-0CA0	CC01	A0
DI 8 x 24 V DC HF	10	6ES7131-6BF00-2CA0	CC01	A0
DI 8 x NAMUR HF	1	6ES7131-6TF00-0CA0	CC01	A0
DI 8 x 24 V DC HS	1	6ES7131-6BF00-0DA0	CC01	A0
With three operating modes: • High-speed isochronous DI • 4 pulse counters, 32-bit, 10 kHz • Oversampling				
DI 4 x 120 ... 230 V AC ST	1	6ES7131-6FD01-0BB1	CC41	B1
DI 8 x 24 V AC ... 48 V UC	1	6ES7131-6CF00-0AU0	CC20	U0

Overview (continued)

Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC00 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC00 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC00 to CC05	--
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC00 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC00 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC00 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC00 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC00 to CC05	--
BU type B1 • Forwarding of load group (dark) • 12 push-in terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	1	6ES7193-6BP20-0BB1	CC41	--
BU type B1 • Forwarding of load group (dark) • 12 push-in terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	10	6ES7193-6BP20-2BB1	CC41	--
BU type U0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC00	--
BU type U0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC00	--
BU type U0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC00	--
BU type U0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC00	--

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital input modules

Overview (continued)

Overview of potential distributor modules

Potential distribution module	PU	Article No.	CC codes for push-in terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-ODP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	1	6ES7193-6UP00-OBP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-ODP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	1	6ES7193-6UP00-OBP2	CC00, CC63
PotDis TB Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

Technical specifications

Article number	6ES7131-6BF01-0AA0	6ES7131-6BF61-0AA0	6ES7131-6BF01-0BA0	6ES7131-6BH01-0BA0
	ET 200SP, DI 8x 24V DC Basic, PU 1	ET 200SP, DI 8x 24V DC SRC BA	ET 200SP, DI 8x 24V DC ST, PU 1	ET 200SP, DI 16x 24V DC ST, PU 1
General information				
Product type designation	DI 8x 24 V DC BA, PU 1	DI 8x24 VDC SRC BA	DI 8x24 VDC ST	DI 16x24VDC ST
Engineering with				
• STEP 7 TIA Portal configurable/integrated as of version	V14	V14	V14	V14
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 or higher	V5.5 SP3
• PCS 7 configurable/integrated as of version			V8.1 SP1	V8.1 SP1
• PROFIBUS as of GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode				
• DI	Yes	Yes	Yes	Yes
• Counter	No	No	No	No
• Oversampling	No	No	No	No
• MSI	No	No	No	No

Technical specifications (continued)

Article number	6ES7131-6BF01-0AA0 ET 200SP, DI 8x 24V DC Basic, PU 1	6ES7131-6BF61-0AA0 ET 200SP, DI 8x 24V DC SRC BA	6ES7131-6BF01-0BA0 ET 200SP, DI 8x 24V DC ST, PU 1	6ES7131-6BH01-0BA0 ET 200SP, DI 16x 24V DC ST, PU 1
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Encoder supply				
Number of outputs	8		8	
Short-circuit protection	Yes; per module	No	Yes; per module	
24 V encoder supply				
• 24 V	Yes		Yes	No
• Short-circuit protection	Yes		Yes	
• Output current, max.			700 mA	
• Output current per channel, max.	700 mA		700 mA	
• Output current per module, max.	700 mA		700 mA	
Digital inputs				
Number of digital inputs	8	8	8	16
Digital inputs, parameterizable	Yes	Yes	Yes	Yes
Source/sink input	P-reading	m-reading	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes		
Input characteristic curve in accordance with IEC 61131, type 2	Yes			
Input characteristic curve in accordance with IEC 61131, type 3	Yes		Yes	Yes
Input voltage				
• Rated value (DC)	24 V	24 V	24 V	24 V
• for signal "0"	-30 to +5V	30 V to -5 V (reference potential is L+)	-30 to +5V	-30 to +5V
• for signal "1"	+11 to +30V	-11 V to -30 V (reference potential is L+)	+11 to +30V	+11 to +30V
Input current				
• for signal "1", typ.	6.8 mA	6 mA	2.5 mA	2.5 mA
Input delay (for rated value of input voltage)				
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)
Encoder				
Connectable encoders				
• 2-wire sensor	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA	1.5 mA	1.5 mA	1.5 mA
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	No	No
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnostic messages				
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
- parameterizable	Yes	Yes	Yes	Yes
• Monitoring of encoder power supply	No	No	Yes; Module-by-module, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	No

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital input modules

Technical specifications (continued)

Article number	6ES7131-6BF01-0AA0 ET 200SP, DI 8x 24V DC Basic, PU 1	6ES7131-6BF61-0AA0 ET 200SP, DI 8x 24V DC SRC BA	6ES7131-6BF01-0BA0 ET 200SP, DI 8x 24V DC ST, PU 1	6ES7131-6BH01-0BA0 ET 200SP, DI 16x 24V DC ST, PU 1
Diagnostic messages (cont.)				
• Wire-break	No	No	Yes; Module-wise	Yes; Module-by-module, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm
• Short-circuit	No	No	Yes; Module-wise	No
• Group error	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
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions		No		
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	28 g	28 g	28 g	28 g

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-0DA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-0CA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120...230V AC ST	6ES7131-6CF00-0AU0 ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
General information					
Product type designation	DI 8x24 V DC HF	DI 8x24 V DC HS	DI 8xNAMUR HF	DI 4x120 ... 230 V AC ST	DI 8x24VAC/48VUC BA
Engineering with					
• STEP 7 TIA Portal configurable/integrated as of version	V13 SP1 / -	V13 SP1	V13 / V13	V14	V15
• STEP 7 configurable/integrated as of version	V5.5 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3	V5.6
• PCS 7 configurable/integrated as of version	V8.1 SP1				
• PROFIBUS as of GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3

Technical specifications (continued)

Article number	6ES7131-6BF00-OCA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-ODA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-OCA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120..230V AC ST	6ES7131-6CF00-0AU0 ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
Operating mode					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter	No	Yes	No	No	No
• Oversampling	No	Yes	No	No	No
• MSI	Yes	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V		48 V
Rated value (AC)				230 V	48 V; 24 V/48 V; 50 Hz/60 Hz
Reverse polarity protection	Yes	Yes	Yes	No	Yes
Encoder supply					
Number of outputs	8		8	4	8
Short-circuit protection	Yes		Yes	No; when using BU type B1, a fuse with 10 A tripping current must be provided	Yes; Per module, 5x 20 mm fuse, 2 A/250 V, quick-response, replaceable
Output current					
• up to 60 °C, max.				10 A	1 A
24 V encoder supply					
• 24 V	Yes	Yes	No		No
• Short-circuit protection	Yes; per channel, electronic	Yes; per module, electronic	No		
• Output current, max.		700 mA			
• Output current per channel, max.	700 mA				
• Output current per module, max.	700 mA				
Digital inputs					
Number of digital inputs	8	8	8; NAMUR	4	8
Digital inputs, parameterizable	Yes		Yes		
Source/sink input	P-reading	P-reading			P-reading
Input characteristic curve in accordance with IEC 61131, type 1					Yes
Input characteristic curve in accordance with IEC 61131, type 2					No
Input characteristic curve in accordance with IEC 61131, type 3	Yes			Yes	No
Pulse extension	Yes; Pulse duration from 4 µs	Yes	Yes; 0.5 s, 1 s, 2 s		No
• Length	2 s; 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s	2 s; 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s			
Edge evaluation	Yes; rising edge, falling edge, edge change		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		
Digital input functions, parameterizable					
• Gate start/stop		Yes			
• Freely usable digital input		Yes			
• Counter		Yes			
• Digital input with oversampling		Yes			
Input voltage					
• Rated value (DC)	24 V	24 V	8.2 V		
• Rated value (AC)				230 V	
• for signal "0"	-30 to +5V	-30 to +5V		0V AC to 40V AC	AC/DC < 10 V
• for signal "1"	+11 to +30V	+11 to +30V		74 V AC to 264 V AC	AC > 14 V, DC > 34 V

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital input modules

Technical specifications (continued)

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-0DA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-0CA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120..230V AC ST	6ES7131-6CF00-0AU0 ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
Input current • for signal *1*, typ.	2.5 mA	6 mA		10.8 mA	3.5 mA
for 10 k switched contact - for signal *0* - for signal *1*			0.35 to 1.2 mA 2.1 to 7 mA		
for unswitched contact - for signal *0*, max. (permissible quiescent current) - for signal *1*			0.5 mA typ. 8 mA		
for NAMUR encoders - for signal *0* - for signal *1*			0.35 to 1.2 mA 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; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	No	No	No
for interrupt inputs - parameterizable		Yes			
for technological functions - parameterizable		Yes			
Encoder					
Connectable encoders • NAMUR encoder/changeover contact according to EN 60947 • Single contact / changeover contact unconnected • Single contact / changeover contact connected with 10 kΩ • 2-wire sensor - permissible quiescent current (2-wire sensor), max.	Yes 1.5 mA	Yes 1.5 mA	Yes Yes Yes	Yes	Yes
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	Yes	Yes	No	No	No
Filtering and processing time (TCI), min.	420 µs				
Bus cycle time (TDP), min.	500 µs	125 µs			
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes		Yes
Alarms					
• Diagnostic alarm	Yes; channel by channel	Yes	Yes; channel by channel	No	Yes
• Hardware interrupt	Yes; Parameterizable, channels 0 to 7	Yes	Yes; Parameterizable, channels 0 to 7	No	

Technical specifications (continued)

Article number	6ES7131-6BF00-OCA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-ODA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-OCA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120..230V AC ST	6ES7131-6CF00-OAU0 ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
Diagnostic messages					
• Diagnostic information readable	Yes	Yes	Yes		Yes
• Monitoring the supply voltage	Yes	Yes	Yes	No	Yes
- parameterizable	Yes	Yes	Yes		
• Monitoring of encoder power supply	Yes; channel by channel	Yes; Module-wise	No		Yes
• Wire-break	Yes; Channel by channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	No	Yes; channel by channel	No	
• Short-circuit	Yes; channel by channel	Yes; Module-wise	Yes; channel by channel	No	
• 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
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	No	Yes; Red LED	No	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
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C	-30 °C	-30 °C		-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C		60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C		-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C		50 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m		2 000 m; On request: Installation altitudes greater than 2 000 m
• Ambient air temperature-barometric pressure-altitude				On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m	
Dimensions					
Width	15 mm	15 mm	15 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	28 g	28 g	32 g	36 g	40 g

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital input modules

Ordering data

Digital input modules

Delivery options:

Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

The number of modules required is the number of modules ordered.

The type of packaging is chosen by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.

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

- PU: 1 unit
- PU: 10 units

6ES7131-6BF01-0AA0
6ES7131-6BF01-2AA0

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

6ES7131-6BF61-0AA0

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

- PU: 1 unit
- PU: 10 units

6ES7131-6BF01-0BA0
6ES7131-6BF01-2BA0

Digital input module
DI 16 x 24 V DC Standard, BU type A0, color code CC00

- PU: 1 unit
- PU: 10 units

6ES7131-6BH01-0BA0
6ES7131-6BH01-2BA0

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

- PU: 1 unit
- PU: 10 units

6ES7131-6BF00-0CA0
6ES7131-6BF00-2CA0

Digital input module
DI 8x24 V DC High Speed, BU type A0, color code CC01; 3 operating modes (fast isochronous DI, 4 pulse counters 32-bit 10 kHz, oversampling); PU: 1 unit

6ES7131-6BF00-0DA0

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

6ES7131-6TF00-0CA0

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

6ES7131-6FD01-0BB1

Digital input module
DI 8x24 V AC ... 48 V UC Basic, BU type U0, color code CC20, module diagnostics, PU: 1 unit

6ES7131-6CF00-0AU0

Suitable BaseUnits

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 push-in 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+A0+2D

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

- 1 unit
- 10 units

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

2BU15-P16+A0+2DB

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- 1 unit

6ES7193-6BP60-0DA0

BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 push-in 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

BU15-P16+A0+2B

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

- 1 unit
- 10 units

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

2BU15-P16+A0+2B

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group

- 1 unit

6ES7193-6BP60-0BA0

BU20-P12+A0+4B

BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the load group; 1 unit

- 1 unit
- 10 units

6ES7193-6BP20-0BB1
6ES7193-6BP20-2BB1

BU20-P16+A0+2D

BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- 1 unit
- 10 units

6ES7193-6BP00-0DU0
6ES7193-6BP00-2DU0

BU20-P16+A0+2B

BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP00-0BU0
6ES7193-6BP00-2BU0

Ordering data	Article No.	Article No.
Potential distributor modules		
PotDis BU		
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	6ES7193-6UP00-ODP1	6ES7193-6CP00-2MA0
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	6ES7193-6UP00-OBP1	6ES7193-6CP01-2MA0
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	6ES7193-6UP00-ODP2	6ES7193-6CP01-4MA0
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	6ES7193-6UP00-OBP2	6ES7193-6CP02-2MA0
PotDis TB		
PotDis TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	6ES7193-6TP00-0TP0	6ES7193-6CP02-4MA0
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	6ES7193-6TP00-0TP1	6ES7193-6CP71-2AA0
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	6ES7193-6TP00-0TP2	6ES7193-6CP72-2AA0
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	6ES7193-6TP00-0TN0	6ES7193-6CP73-2AA0
Accessories		
Equipment labeling plate		
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0	6ES7193-6CP73-4AA0
Labeling strips		
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	6ES7193-6CP41-2MB0
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AA0	
1000 labeling strips DIN A4, yellow, card, perforated, 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		
5 shield supports and 5 shield terminals	6ES7193-6SC00-1AM0	
Color-coded labels for 15 mm-wide BaseUnits		
	Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	
	Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	
	Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	
	Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units	
	Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units	
	Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	
	Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	
	Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	
	Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units	
Color-coded labels for 20 mm-wide BaseUnits		
	Color code CC41, for 16 push-in terminals; BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	
Color-coded labels for PotDis BU		
	Color code CC62, for 16 push-in terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	6ES7193-6CP62-2MA0
	Color code CC63, for 16 push-in terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	6ES7193-6CP63-2MA0
Color-coded labels for PotDis TB		
	Color code CC10, for 18 push-in terminals, PotDis TB, gray (terminals 1 to 18); 10 units	6ES7193-6CP10-2MT0
	Color code CC11, for 18 push-in terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units	6ES7193-6CP11-2MT0
	Color code CC12, for 18 push-in terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	6ES7193-6CP12-2MT0
	Color code CC13, for 18 push-in terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	6ES7193-6CP13-2MT0

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital output modules

Overview



- 4, 8 and 16-channel digital output (DQ) modules
- Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital output modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DQ (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)
- Option of connecting actuators with rated load voltages of up to 120 V DC or 230 V AC and load currents of up to 5 A (depending on module)
- Relay modules
 - NO contact or changeover contact
 - for load or signal voltages (coupling relay)
 - with manual operation (as simulation module for inputs and outputs, jog mode for commissioning or emergency operation on failure of controller)

- PNP (source output) and NPN (sink output) versions
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - MSO operating mode (simultaneous reading of input data from as many as three other controllers)
 - Pulse width modulation mode (output value as pulse-pause ratio of between 0.0% and 100.0% for controlling the output current)
 - Oversampling operating mode (n-fold equidistant output of digital values within a PN cycle for the precise time control of an output or a sequence of output values)
 - Isochronous mode (simultaneous equidistant output of all output channels)
 - Output of substitute value in the event of interruptions to communication (0, 1 or last value retained)
 - Re-parameterization during operation
 - Firmware update
 - Valve control (output signal does not switch automatically after a set pickup time to a current-saving PWM output)
 - Diagnosis of wire break and short-circuit (on channel or module basis)
 - Value status (optional binary validity information of the output signal in the process image)
 - Supports the PROFINergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shielding terminal

A quick and clear comparison of the functions of the different DQ modules is offered by the TIA Selection Tool.

Overview (continued)Overview of digital output modules

Digital output	PU	Article No.	CC code	BU type
DQ 16 x 24 V DC/0.5 A BA	1	6ES7132-6BH00-0AA0	CC00	A0
DQ 16 x 24 V DC/0.5 A BA	10	6ES7132-6BH00-2AA0	CC00	A0
DQ 16 x 24 V DC/0.5 A ST	1	6ES7132-6BH01-0BA0	CC00	A0
DQ 16 x 24 V DC/0.5 A ST	10	6ES7132-6BH01-2BA0	CC00	A0
DQ 8 x 24 V DC/0.5 A SNK BA	1	6ES7132-6BF61-0AA0	CC01	A0
DQ 8 x 24 V DC/0.5 A BA	1	6ES7132-6BF01-0AA0	CC02	A0
DQ 8 x 24 V DC/0.5 A BA	10	6ES7132-6BF01-2AA0	CC02	A0
DQ 8 x 24 V DC/0.5 A ST	1	6ES7132-6BF01-0BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A ST	10	6ES7132-6BF01-2BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	1	6ES7132-6BF00-0CA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	10	6ES7132-6BF00-2CA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	1	6ES7132-6BD20-0BA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	10	6ES7132-6BD20-2BA0	CC02	A0
DQ 4 x 24 V DC/2 A HF	1	6ES7132-6BD20-0CA0	CC02	A0
DQ 4 x 24 V DC/2 A HS	1	6ES7132-6BD20-0DA0	CC02	A0
With three operating modes: • Fast isochronous DQ with valve control • Pulse width modulation • Oversampling				
DQ 4 x 24 ... 230 V AC/2 A ST	1	6ES7132-6FD00-0BB1	CC41	B0, B1
DQ 4 x 24 ... 230 V AC/2 A ST	10	6ES7132-6FD00-2BB1	CC41	B0, B1
DQ 4 x 24 ... 230 V AC/2 A HF	1	6ES7132-6FD00-0CU0	CC20	U0
With two operating modes: • DQ • PC: Power control via phase angle, half-wave or full-wave control				
RQ 4 x 24 V UC/2 A CO ST	1	6ES7132-6GD51-0BA0	--	A0
RQ 4 x 120 V DC-230 V AC/5 A NO ST	1	6ES7132-6HD01-0BB1	--	B0, B1
RQ 4 x 120 V DC-230 V AC/5 A NO ST	10	6ES7132-6HD01-2BB1	--	B0, B1
RQ MA 4 x 120 V DC ... 230 V AC/5 A NO ST	1	6ES7132-6MD00-0BB1	--	B0, B1

Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73

I/O SystemsSIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP**I/O modules > Digital output modules****Overview** (continued)

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type B0 • Forwarding of load group (dark) • 12 push-in terminals • With 4 AUX terminals	1	6ES7193-6BP20-0BB0	CC41	CC81 to CC83
BU type B0 • Forwarding of load group (dark) • 12 push-in terminals • With 4 AUX terminals	10	6ES7193-6BP20-0BB0	CC41	CC81 to CC83
BU type B1 • Forwarding of load group (dark) • 12 push-in terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	1	6ES7193-6BP20-0BB1	CC41	--
BU type B1 • Forwarding of load group (dark) • 12 push-in terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	10	6ES7193-6BP20-2BB1	CC41	--
BU type U0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC20	--
BU type U0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC20	--
BU type U0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC20	--
BU type U0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC20	--

Overview (continued)Overview of potential distributor modules

Potential distribution module	PU	Article No.	CC codes for push-in terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-ODP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	1	6ES7193-6UP00-OBP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-ODP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	1	6ES7193-6UP00-OBP2	CC00, CC63
PotDis TB Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

Technical specifications

Article number	6ES7132-6BH00-0AA0	6ES7132-6BH01-0BA0	6ES7132-6BF61-0AA0	6ES7132-6BF01-0AA0	6ES7132-6BF01-0BA0
	ET 200SP, DQ 16x24VDC/0.5A BA, PU 1	ET 200SP, DQ 16x 24V DC/0.5A ST, PU 1	ET 200SP, DQ 8x 24VDC/0.5A SINK BA, PU 1	ET 200SP, DQ 8x 24V DC/0.5A Basic, PU 1	ET 200SP, DQ 8x 24V DC/0.5A ST, PU 1
General information					
Product type designation	DQ 16x 24 V DC/0.5 A BA, PU 1	DQ 16x24VDC/0.5A ST, PU 1	DQ 8x24VDC/0,5A SNK BA	DQ 8x 24 V DC/0.5 A BA, PU 1	DQ 8x24VDC/0.5A ST
Engineering with					
• STEP 7 TIA Portal configurable/ integrated as of version	V14	V14	V14	V14	V14
• STEP 7 configurable/integrated as of version	STEP 7 V5.5 or higher	V5.5 SP3	V5.5 SP3	V5.5 SP3	V5.5 SP3 or higher
• PCS 7 configurable/integrated as of version		V8.1 SP1			V8.1 SP1
• PROFIBUS as of GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
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	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes		Yes	Yes

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications (continued)

Article number	6ES7132-6BH00-0AA0 ET 200SP, DQ 16X24VDC/0.5A BA, PU 1	6ES7132-6BH01-0BA0 ET 200SP, DQ 16x 24V DC/0.5A ST, PU 1	6ES7132-6BF61-0AA0 ET 200SP, DQ 8x 24VDC/0.5A SINK BA, PU 1	6ES7132-6BF01-0AA0 ET 200SP, DQ 8x 24V DC/0.5A Basic, PU 1	6ES7132-6BF01-0BA0 ET 200SP, DQ 8x 24V DC/0.5A ST, PU 1
Digital outputs					
Type of digital output	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Sink output (NPN)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)
Number of digital outputs	16	16	8	8	8
Current-sinking	No	No	Yes		
Current-sourcing	Yes	Yes		Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes	Yes; per channel, electronic	Yes
Open-circuit detection	No	Yes			
Limitation of inductive shutdown voltage to	Typ. L+ (-53 V)	Typ. L+ (-50 V)	Typ. 47 V	Typ. L+ (-50 V)	Typ. L+ (-50 V)
Controlling a digital input	Yes	Yes	Yes	Yes	Yes
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• on lamp load, max.	5 W	5 W	5 W	5 W	5 W
Load resistance range					
• lower limit	48 Ω	48 Ω	48 Ω	48 Ω	48 Ω
• upper limit	100 kΩ	12 kΩ	3 400 Ω	100 kΩ	12 kΩ
Output voltage					
• for signal "1", min.					L+ (-0.8 V)
Output current					
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	30 μA	0.1 mA	5 μA	10 μA	0.1 mA
Output delay with resistive load					
• "0" to "1", typ.	80 μs; at rated load	50 μs			
• "0" to "1", max.	150 μs; at rated load		300 μs	100 μs; at rated load	50 μs; at rated load
• "1" to "0", typ.	100 μs; at rated load	100 μs			
• "1" to "0", max.	200 μs; at rated load		600 μs	150 μs; at rated load	100 μs; at rated load
Parallel switching of two outputs					
• for uprating	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.	2 Hz	2 Hz	0.5 Hz	2 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz
Total current of the outputs					
• Current per channel, max.	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• Current per module, max.	8 A	8 A	4 A	4 A	4 A
Total current of the outputs (per module)					
horizontal installation					
- up to 30 °C, max.		8 A		4 A	4 A
- up to 40 °C, max.		8 A		4 A	4 A
- up to 50 °C, max.		6 A		4 A	4 A
- up to 60 °C, max.	8 A	4 A	4 A	4 A	4 A
vertical installation					
- up to 30 °C, max.		8 A		4 A	4 A
- up to 40 °C, max.		6 A		4 A	4 A
- up to 50 °C, max.	8 A	4 A	4 A	4 A	4 A

Technical specifications (continued)

Article number	6ES7132-6BH00-0AA0 ET 200SP, DQ 16x24VDC/0.5A BA, PU 1	6ES7132-6BH01-0BA0 ET 200SP, DQ 16x 24V DC/0.5A ST, PU 1	6ES7132-6BF61-0AA0 ET 200SP, DQ 8x 24VDC/0.5A SINK BA, PU 1	6ES7132-6BF01-0AA0 ET 200SP, DQ 8x 24V DC/0.5A Basic, PU 1	6ES7132-6BF01-0BA0 ET 200SP, DQ 8x 24V DC/0.5A ST, PU 1
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	No	No	No	No
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostic messages					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break	No	Yes; Module-wise	No	No	Yes; Module-wise
• Short-circuit	No		No	No	
• Short-circuit to M		Yes; Module-wise			Yes; Module-wise
• Short-circuit to L+		Yes; Module-wise			Yes; Module-wise
• Group error	Yes	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	No	No	No	No	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
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Suitable for safety-related tripping of standard modules		Yes; From FS01		Yes; From FS01	Yes; From FS01
Highest safety class achievable in safety mode					
• Performance level according to ISO 13849-1		PL d		PL d	PL d
• SIL acc. to IEC 61508		SIL 2		SIL 2	SIL 2
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C	-30 °C	-25 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-25 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	30 g	30 g	30 g	30 g	30 g

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications (continued)

Article number	6ES7132-6BF00-0CA0 ET 200SP, DQ 8x24VDC/0.5A HF, PU 1	6ES7132-6BD20-0BA0 ET 200SP, DQ 4x24VDC/2A ST	6ES7132-6BD20-0CA0 ET 200SP, DQ 4x24VDC/2A HF, PU 1	6ES7132-6BD20-0DA0 ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	6ES7132-6FD00-0BB1 ET 200SP, DQ 4x24...230VAC/2A ST
General information					
Product type designation	DQ 8x24 V DC/0.5 A HF	DQ 4x24 V DC/2 A ST	ET 200SP, DQ 4x 24 V DC/2 A HF, PU 1	DQ 4x24 V DC/2 A HS	DQ 4x24 ... 230 V AC/ 2 A ST
Engineering with					
• STEP 7 TIA Portal configurable/integrated as of version	V13 SP1 / -	V11 SP2 / V13	V13 SP1 / -	STEP 7 V15.1 or higher	V13 / V13
• STEP 7 configurable/integrated as of version	V5.5 / -	V5.5 SP3 / -	V5.5 / -	Via GSD as of V5.6 HF4	V5.5 SP3 / - HF4
• PCS 7 configurable/integrated as of version	V8.1 SP1	V8.1 SP1			
• PROFIBUS as of GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.33	GSDML V2.3
Operating mode					
• DQ	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	Yes; Valve control	No
• PWM	No	No	No	Yes	No
• Cam control (switching at comparison values)				Yes; Via MtM (module-to-module communication)	
• Oversampling	No	No	No	Yes	No
• MSO	Yes	No	Yes	No	No
Supply voltage					
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	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)		Source output (PNP, current-sourcing)	Triac with zero point detection
Number of digital outputs	8	4	4	4	4
Current-sinking	No	No	No	No	No
Current-sourcing	Yes	Yes	Yes	Yes; Push-pull output	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes	No
Short-circuit protection	Yes	Yes	Yes	Yes	No; When using BU type B1, a miniature, quick-response fuse with 10 A tripping current must be provided
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	Typ. L+ (-50 V)	L+ -(37 to 41V)	M (-1 V)	
Controlling a digital input	Yes	Yes	Yes; Minimum current consumption 7 mA	No	Yes
Size of motor starters according to NEMA, max.					5

Technical specifications (continued)

Article number	6ES7132-6BF00-0CA0 ET 200SP, DQ 8x24VDC/0.5A HF, PU 1	6ES7132-6BD20-0BA0 ET 200SP, DQ 4x24VDC/2A ST	6ES7132-6BD20-0CA0 ET 200SP, DQ 4x24VDC/2A HF	6ES7132-6BD20-0DA0 ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	6ES7132-6FD00-0BB1 ET 200SP, DQ 4x24VDC/2A ST
Digital output functions, parameterizable					
• Switching tripped by comparison values				Yes	
- Number of cam tracks, max.				4	
• Freely usable digital output				Yes	
• PWM output				Yes	
- Number, max.				4	
• Digital output with oversampling				Yes	
- Number, max.				4	
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	2 A	2 A	2 A	2 A
• on lamp load, max.	5 W	10 W	10 W	10 W	100 W
Load resistance range					
• lower limit	48 Ω	12 Ω	12 Ω	12 Ω	
• upper limit	12 kΩ	3 400 Ω	3 400 Ω	3 400 Ω	
Output voltage					
• for signal "1", min.					20.4 V
Output current					
• for signal "1" rated value	0.5 A	2 A	2 A	2 A	2 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA	0.1 mA	0.1 mA	460 μA
Output delay with resistive load					
• "0" to "1", typ.	50 μs	50 μs	50 μs		
• "0" to "1", max.		50 μs		1 μs	10 ms
• "1" to "0", typ.	100 μs	100 μs	100 μs		
• "1" to "0", max.		100 μs		1 μs	10 ms
Parallel switching of two outputs					
• for logic links					No
• for uprating	No	No	No	No	No
• for redundant control of a load	Yes	Yes			Yes
Switching frequency					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	5 kHz	10 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz	5 kHz	0.5 Hz; Higher frequencies are possible, see Equipment Manual / Product Information
• on lamp load, max.	10 Hz	10 Hz	10 Hz	5 kHz	1 Hz
Total current of the outputs					
• Current per channel, max.	0.5 A	2 A	2 A	2 A	2 A
• Current per module, max.	4 A	8 A	8 A	8 A	8 A
Total current of the outputs (per module)					
horizontal installation					
- up to 30 °C, max.		8 A		8 A; DQ mode	
- up to 40 °C, max.		8 A	8 A	6.9 A; DQ mode	8 A
- up to 50 °C, max.		6 A	6 A	4.7 A; DQ mode	6 A
- up to 60 °C, max.	4 A	4 A	4 A	2.5 A; DQ mode	4 A
vertical installation					
- up to 30 °C, max.		8 A	8 A	7.2 A; DQ mode	8 A
- up to 40 °C, max.		6 A	6 A	5.6 A; DQ mode	6 A
- up to 50 °C, max.	4 A	4 A	4 A	4 A; DQ mode	4 A
- up to 60 °C, max.		4 A			
Cable length					
• shielded, max.	1 000 m	1 000 m	1 000 m	50 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	50 m	600 m

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications (continued)

Article number	6ES7132-6BF00-0CA0 ET 200SP, DQ 8x24VDC/0.5A HF, PU 1	6ES7132-6BD20-0BA0 ET 200SP, DQ 4x24VDC/2A ST	6ES7132-6BD20-0CA0 ET 200SP, DQ 4x24VDC/2A HF	6ES7132-6BD20-0DA0 ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	6ES7132-6FD00-0BB1 ET 200SP, DQ 4x24...230VAC/2A ST
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	Yes	No	Yes	Yes; Operating modes DQ and OVS only	No
Execution and activation time (TCO), min.	48 µs			40 µs	
Bus cycle time (TDP), min.	500 µs		500 µs	125 µs	
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	No
Diagnostics function				Yes	
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	No
Diagnostic messages					
• Diagnostic information readable				Yes	
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	No
• Wire-break	Yes; channel by channel	Yes; Module-wise	Yes; channel by channel	No	No
• Short-circuit	Yes; channel by channel	Yes; Module-wise	Yes; channel by channel	Yes; Module-wise	No
• Group error	Yes	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	No	Yes; Red LED	No	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
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS03	Yes; From FS02	No	
Highest safety class achievable in safety mode					
• Performance level according to ISO 13849-1	PL d	PL d	PL d		
• SIL acc. to IEC 61508	SIL 2	SIL 2	SIL 2		
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	60 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	30 g	30 g	30 g	31 g	50 g

Technical specifications (continued)

Article number	6ES7132-6FD00-0CU0 ET 200SP, DQ 4x24...230VAC/2A HF, PU 1	6ES7132-6GD51-0BA0 ET 200SP, RQ CO 4x 24V DC/2A ST, PU 1	6ES7132-6HD01-0BB1 ET 200SP, RQ NO 4x 120VDC...230VAC/ 5A,PU1	6ES7132-6MD00-0BB1 ET 200SP, RQ NO-MA 4x120VDC...230VAC/5A ST
General information				
Product type designation	DQ 4x24 ... 230 V AC/2 A HF, PU 1	RQ CO 4x24VDC/2A ST	RQ 4x120 VDC ... 230 VAC/5 A NO ST	RQ 4x120 V DC ... 230 V AC/ 5 A NO MA ST
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V14	V14	V14	V13 SP1
• STEP 7 configurable/integrated as of version	STEP 7 V5.5 or higher	V5.5 SP3	V5.5 SP3	V5.5 SP3 / -
• PCS 7 configurable/integrated as of version			V8.1 SP1	
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	Yes	No	No	No
• PWM	No	No	No	No
• Oversampling	No	No	No	No
• MSO	No	No	No	No
• Phase control	Yes; Control area: 8.5 ... 100% of the phase angle			
• Trailing-edge phase	No			
• Half-wave	Yes			
• Full-wave	Yes			
Supply voltage				
Rated value (DC)		24 V	24 V	24 V
Rated value (AC)	230 V; 47 ... 63 Hz, max. rate of change of frequency 1 mHz/s			
Reverse polarity protection		Yes	Yes	Yes
Digital outputs				
Type of digital output		Relays	Relays	Relays
Number of digital outputs	4	4	4	4
Current-sinking	No	Yes	Yes	
Current-sourcing	Yes	Yes	Yes	
Digital outputs, parameterizable	Yes	Yes	Yes	
Short-circuit protection	No; external fusing necessary	No	No	No
Open-circuit detection	Yes; channel by channel			
Overload protection	No; A miniature fuse with 10 tripping current and tripping characteristic "quick response" must be provided in the module supply			
Controlling a digital input	Yes			
Switching capacity of the outputs				
• with resistive load, max.	2 A; Max. 4 A, see additional description in manual			
• with inductive load, max.	2 A			
• on lamp load, max.	100 W; Tungsten rating in accordance with UL; for thermistors with higher power ratings, see the notes in the manual			
Output voltage				
• for signal "1", min.	20.4 V			
Output current				
• for signal "1" rated value	2 A			
• for signal "0" residual current, max.	3 mA			

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications (continued)

Article number	6ES7132-6FD00-0CU0 ET 200SP, DQ 4x24..230VAC/2A HF, PU 1	6ES7132-6GD51-0BA0 ET 200SP, RQ CO 4x 24V DC/2A ST, PU 1	6ES7132-6HD01-0BB1 ET 200SP, RQ NO 4x 120VDC..230VAC/ 5A,PU1	6ES7132-6MD00-0BB1 ET 200SP, RQ NO-MA 4x120VDC..230VAC/5A ST
Output delay with resistive load				
• "0" to "1", max.	40 ms; 2 AC cycles			
• "1" to "0", max.	20 ms; 1 AC cycle			
Parallel switching of two outputs				
• for logic links	No	Yes	Yes	
• for uprating	No	No	No	
• for redundant control of a load	Yes	Yes	Yes	
Switching frequency				
• with resistive load, max.	10 Hz; Applies to DQ mode; limited by line frequency in PC mode	2 Hz	2 Hz	2 Hz
• with inductive load, max.			0.5 Hz	0.5 Hz
• with inductive load (acc. to IEC 60947-5-1, AC15), max.	10 Hz; Applies to DQ mode; limited by line frequency in PC mode			
• on lamp load, max.	1 Hz; Applies to DQ mode; limited by line frequency in PC mode		2 Hz	2 Hz
Total current of the outputs				
• Current per channel, max.	2 A; Max. 4 A, see additional description in manual	2 A	5 A	5 A
• Current per module, max.	8 A	8 A	20 A	20 A
Total current of the outputs (per module)				
horizontal installation				
- up to 40 °C, max.	8 A	8 A		
- up to 50 °C, max.	6 A	6 A	20 A	20 A
- up to 60 °C, max.	4 A	4 A	16 A	16 A
vertical installation				
- up to 30 °C, max.	8 A	8 A		
- up to 40 °C, max.	6 A	6 A	20 A	20 A
- up to 50 °C, max.	4 A	4 A	16 A	16 A
Relay outputs				
• Number of relay outputs		4	4	4
• Rated supply voltage of relay coil L+ (DC)		24 V	24 V	24 V
• Current consumption of relays (coil current of all relays), max.		40 mA	40 mA	40 mA
• external protection for relay outputs			Yes, with 6A	Yes, with 6A
• Number of operating cycles, max.			7 000 000; see additional description in the manual	7 000 000; see additional description in the manual
Switching capacity of contacts				
- with inductive load, max.			2 A; see additional description in the manual	2 A; see additional description in the manual
- with resistive load, max.		2 A	5 A; see additional description in the manual	5 A; see additional description in the manual
- Thermal continuous current, max.		2 A	5 A; Max. 1 385 VA, 150 W	5 A
- Switching current, min.		1 mA; 5 V DC	100 mA; 5 V DC	100 mA; 5 V DC
- Rated switching voltage (DC)		24 V	24 V DC to 120 V DC	24 V DC to 120 V DC
- Rated switching voltage (AC)		24 V	24V AC to 230V AC	24V AC to 230V AC

Technical specifications (continued)

Article number	6ES7132-6FD00-0CU0 ET 200SP, DQ 4x24..230VAC/2A HF, PU 1	6ES7132-6GD51-0BA0 ET 200SP, RQ CO 4x 24V DC/2A ST, PU 1	6ES7132-6HD01-0BB1 ET 200SP, RQ NO 4x 120VDC..230VAC/ 5A,PU1	6ES7132-6MD00-0BB1 ET 200SP, RQ NO-MA 4x120VDC..230VAC/5A ST
Cable length				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	200 m	200 m	200 m
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	No	
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnostic messages				
• Diagnostic information readable	Yes			
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire-break	Yes; channel by channel	No	No	No
• Short-circuit	No	No	No	No
• Group error	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
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; red Fn LED	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	
Dimensions				
Width	20 mm	15 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	50 g	30 g	40 g	45 g

I/O SystemsSIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP**I/O modules > Digital output modules****Ordering data****Article No.****Article No.****Digital output modules**

Type of delivery:

Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

The number of modules required is the number of modules ordered. The type of packaging is chosen by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.

Digital output module
DQ 16x24 V DC/0.5 A Basic,
BU type A0, color code CC00

- PU: 1 unit
- PU: 10 units

Digital output module
DQ 16x24 V DC/0.5 A Standard,
BU type A0, color code CC00

- PU: 10 units

Digital output module
DQ 16x24 V DC/0.5 A Standard,
source output, BU type A0,
color code CC00

- PU: 1 unit
- PU: 10 units

Digital output module
DQ 8x24 V DC/0.5 A sink output,
Basic, BU type A0,
color code CC01

- PU: 1 unit

6ES7132-6BH00-0AA0
6ES7132-6BH00-2AA0

6ES7132-6BH00-2BA0

6ES7132-6BH01-0BA0
6ES7132-6BH01-2BA0

6ES7132-6BF61-0AA0

Digital output module
DQ 8x24 V DC/0.5 A Basic,
BU type A0, color code CC02

- PU: 1 unit
- PU: 10 units

Digital output module
DQ 8x24 V DC/0.5 A Standard,
BU type A0, color code CC02

- PU: 1 unit
- PU: 10 units

Digital output module
DQ 8x24 V DC/0.5 A High Feature,
BU type A0, color code CC02

- PU: 1 unit
- PU: 10 units

Digital output module
DQ 4x24 V DC/2 A Standard,
BU type A0, color code CC02

- PU: 1 unit
- PU: 10 units

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

Digital output module
DQ 4x24 V DC/2 A High Speed,
BU type A0, color code CC02,
3 operating modes
(fast isochronous DQ with valve
control, pulse width modulation,
oversampling)

- PU: 1 unit

Digital output module
DQ 4x24 V AC ... 230 V AC/2 A
Standard for BU type B1,
color code CC41

- PU: 1 unit
- PU: 10 units

6ES7132-6BF01-0AA0
6ES7132-6BF01-2AA0

6ES7132-6BF01-0BA0
6ES7132-6BF01-2BA0

6ES7132-6BF00-0CA0
6ES7132-6BF00-2CA0

6ES7132-6BD20-0BA0
6ES7132-6BD20-2BA0

6ES7132-6BD20-0CA0

6ES7132-6BD20-0DA0

6ES7132-6FD00-0BB1
6ES7132-6FD00-2BB1

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital output modules

Ordering data	Article No.	Article No.
PotDis TB PotDis TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A) PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A) PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A) PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	6ES7193-6TP00-0TP0 6ES7193-6TP00-0TP1 6ES7193-6TP00-0TP2 6ES7193-6TP00-0TN0	Color-coded labels for 15 mm-wide BaseUnits (cont.) Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units
Accessories Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0	6ES7193-6CP02-4MA0 6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0 6ES7193-6CP73-4AA0
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, perforated, for inscription with laser printer 1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0	Color-coded labels for 20 mm-wide BaseUnits Color code CC41, for 16 push-in terminals; BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A); 10 units Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A); 10 units Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A); 10 units
BU cover For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0	6ES7193-6CP41-2MB0 6ES7193-6CP81-2AB0 6ES7193-6CP82-2AB0 6ES7193-6CP83-2AB0
Shield connection 5 shield supports and 5 shield terminals	6ES7193-6SC00-1AM0	Color-coded labels for PotDis BU Color code CC62, for 16 push-in terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units Color code CC63, for 16 push-in terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units
Color-coded labels for 15 mm-wide BaseUnits Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units	6ES7193-6CP00-2MA0 6ES7193-6CP01-2MA0 6ES7193-6CP01-4MA0 6ES7193-6CP02-2MA0	Color-coded labels for PotDis TB Color code CC10, for 18 push-in terminals, PotDis TB, gray (terminals 1 to 18); 10 units Color code CC11, for 18 push-in terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units Color code CC12, for 18 push-in terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units Color code CC13, for 18 push-in terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units

Overview



- 2, 4 and 8-channel analog input (AI) modules
 - Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.
- For different requirements, the digital output modules offer:
- Function classes Basic, Standard, High Feature and High Speed
 - BaseUnits for single or multiple-conductor connection with automatic slot coding
 - Potential distributor modules for system-integrated expansion with potential terminals
 - Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)
 - Option of connecting current, voltage and resistance sensors, as well as thermocouples
 - Option of connecting force and torque sensors
 - Energy Meter for recording up to 200 electrical variables
 - Clear labeling on front of module
 - LEDs for diagnostics, status, supply voltage and faults

- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
 - Oversampling operating mode (n-fold equidistant acquisition of analog values within one PN cycle for increasing the time resolution for slow CPU cycles)
 - Isochronous mode (simultaneous equidistant reading in of all analog values)
 - Scalable measuring range (adaptation of measuring range, increase of the 16-bit resolution by adapting the measuring range to a limited section)
 - Scaling of the measured values (transmission of the analog value normalized to the required physical value as a 32-bit floating point value)
 - Internal compensation of the line resistance for thermocouples by means of terminal temperature measurement in the BaseUnit for BU type A1
 - Internal compensation also for 2-conductor resistance measurement by means of adjustable line resistance
 - Calibration during runtime
 - Single-channel galvanic isolation
 - HART communication
 - Re-parameterization during operation
 - Firmware update
 - Diagnosis of wire break, short circuit, overflow, underflow
 - Two upper and lower hardware interrupts in each case, interference frequency suppression, smoothing
 - Value status (optional binary validity information of the analog signal in the process image)
 - Supports the PROFlenergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shielding terminal

A quick and clear comparison of the functions of the AI modules is offered by the TIA Selection Tool.

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog input modules

Overview (continued)

Overview of analog input modules

Analog input	PU	Article No.	CC code	BU type
AI 8 x I 2/4-wire BA	1	6ES7134-6GF00-0AA1	CC01	A0, A1
AI 2 x U ST	1	6ES7134-6FB00-0BA1	CC00	A0, A1
AI 8 x U BA	1	6ES7134-6FF00-0AA1	CC02	A0, A1
AI 4 x U/I 2-wire ST	1	6ES7134-6HD00-0BA1	CC03	A0, A1
AI 4 x U/I 2-wire ST	10	6ES7134-6HD00-2BA1	CC03	A0, A1
AI 2 x I 2/4-wire ST	1	6ES7134-6GB00-0BA1	CC05	A0, A1
AI 4 x I 2/4-wire ST	1	6ES7134-6GD00-0BA1	CC03	A0, A1
AI 4 x I 2/4-wire ST	10	6ES7134-6GD00-2BA1	CC03	A0, A1
AI 4 x I 2-wire 4 ... 20 mA HART	1	6ES7134-6TD00-0CA1	CC03	A0, A1
AI 2 x U/I 2/4-wire HF	1	6ES7134-6HB00-0CA1	CC05	A0, A1
AI 2 x U/I 2/4-wire HS	1	6ES7134-6HB00-0DA1	CC00	A0, A1
With two operating modes: • High-speed isochronous AI • Oversampling				
AI 8 x RTD/TC 2-wire HF	1	6ES7134-6JF00-0CA1	CC00	A0, A1
AI 8 x RTD/TC 2-wire HF	10	6ES7134-6JF00-2CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	1	6ES7134-6JD00-0CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	10	6ES7134-6JD00-2CA1	CC00	A0, A1
AI 4 x TC High Speed	1	6ES7134-6JD00-0DA1	CC00	A0, A1
AI 2 x SG 4/6-wire High Speed	1	7MH4134-6LB00-0DA0	CC00	A0
AI Energy Meter 400 V AC ST	1	6ES7134-6PA01-0BD0	--	D0
AI Energy Meter 480 V AC ST	1	6ES7134-6PA20-0BD0	--	D0
AI Energy Meter 480 V AC/CT High Feature	1	6ES7134-6PA00-0CU0	--	U0
AI Energy Meter 480 V AC/RT High Feature	1	6ES7134-6PA20-0CU0	--	U0

Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73

Overview (continued)

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type A1 • New load group (light) • With temperature sensor • 16 push-in terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0DA1	CC01 to CC05	CC74
BU type A1 • New load group (light) • With temperature sensor • 16 push-in terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0DA1	CC01 to CC05	--
BU type A1 • Forwarding of load group (dark) • With temperature sensor • 16 push-in terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0BA1	CC01 to CC05	CC74
BU type A1 • Forwarding of load group (dark) • With temperature sensor • 16 push-in terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0BA1	CC01 to CC05	--
BU type D0 • Forwarding of load group (dark) • 12 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BD0	--	--
BU type U0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC00	--
BU type U0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC00	--
BU type U0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC00	--
BU type U0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC00	--

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog input modules

Overview (continued)

Overview of potential distributor modules

Potential distribution module	PU	Article No.	CC codes for push-in terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-ODP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	1	6ES7193-6UP00-OBP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-ODP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	1	6ES7193-6UP00-OBP2	CC00, CC63
PotDis TB Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

Technical specifications

Article number	6ES7134-6GF00-0AA1	6ES7134-6FB00-0BA1	6ES7134-6FF00-0AA1	6ES7134-6HD01-0BA1	6ES7134-6GB00-0BA1
	ET 200SP, AI 8xI 2/4-wire Basic	ET 200SP, AI 2xU Standard, PU 1	ET 200SP, AI 8xU Basic	ET 200SP, AI 4xU/I 2-Wire ST, PU 1	ET 200SP, AI 2xI 2/4-wire ST, PU 1
General information					
Product type designation	AI 8xI 2-/4-wire BA	AI 2xU ST	AI 8xU BA	AI 4x U/I 2-wire	AI 2xI 2-/4-wire ST
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
• Measuring range scalable	No	No	No	No	No
Engineering with					
• STEP 7 TIA Portal configurable/integrated as of version	V13 SP1	V13 SP1	V13 SP1	V14 / -	V13 SP1
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.6 and higher	V5.5 SP3
• PCS 7 configurable/integrated as of version				V8.1 SP1	
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	V2.3 / -
Operating mode					
• Oversampling	No	No	No	No	No
• MSI	No	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7134-6GF00-0AA1 ET 200SP, AI 8xI 2/4-wire Basic	6ES7134-6FB00-0BA1 ET 200SP, AI 2xU Standard, PU 1	6ES7134-6FF00-0AA1 ET 200SP, AI 8xU Basic	6ES7134-6HD01-0BA1 ET 200SP, AI 4xU/I 2-Wire ST, PU 1	6ES7134-6GB00-0BA1 ET 200SP, AI 2xI 2/4-wire ST, PU 1
Analog inputs					
Number of analog inputs	8; Single-ended	2	8; Single-ended	4; Differential inputs	2
• For current measurement	8				2
• For voltage measurement		2	8		
permissible input voltage for voltage input (destruction limit), max.		30 V	30 V	30 V	
permissible input current for current input (destruction limit), max.	50 mA			50 mA	50 mA
Cycle time (all channels), min.	1 ms; per channel	500 µs	1 ms; per channel	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	500 µs
Input ranges (rated values), voltages					
• 0 to +10 V		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit	
• 1 V to 5 V		Yes; 15 bit		Yes; 15 bit	
• -10 V to +10 V		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• -5 V to +5 V		Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
Input ranges (rated values), currents					
• 0 to 20 mA	Yes			Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	Yes				Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes			Yes; 15 bit	Yes; 15 bit
Cable length					
• shielded, max.	200 m	200 m	200 m	1 000 m; 200 m for voltage measurement	1 000 m
Analog value generation for the inputs					
Measurement principle		Sigma Delta		integrating (Sigma-Delta)	Sigma Delta
Integration and conversion time/resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f ₁ in Hz	16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)	16.6 / 50 / 60 Hz / off	16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz / off
• Conversion time (per channel)	180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms	50 ms @ 60 Hz, 60 ms @ 50 Hz, 180 ms @ 16.6 Hz, 250 µs without filter	180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms	180 / 60 / 50 ms	50 ms @ 60 Hz, 60 ms @ 50 Hz, 180 ms @ 16.6 Hz, 500 µs without filter
Smoothing of measured values					
• Number of smoothing levels	4; None; 4/8/16 times	4	4; None; 4/8/16 times	4; None; 4/8/16 times	4
• parameterizable	Yes	Yes	Yes	Yes	Yes
Encoder					
Connection of signal encoders					
• for voltage measurement	No	Yes	Yes	Yes	
• for current measurement as 2-wire transducer	Yes			Yes	Yes
- Burden of 2-wire transmitter, max.	650 Ω			650 Ω	650 Ω
• for current measurement as 4-wire transducer	Yes		No	No	Yes

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications (continued)

Article number	6ES7134-6GF00-0AA1 ET 200SP, AI 8xI 2/4-wire Basic	6ES7134-6FB00-0BA1 ET 200SP, AI 2xU Standard, PU 1	6ES7134-6FF00-0AA1 ET 200SP, AI 8xU Basic	6ES7134-6HD01-0BA1 ET 200SP, AI 4xU/I 2-Wire ST, PU 1	6ES7134-6GB00-0BA1 ET 200SP, AI 2xI 2/4-wire ST, PU 1
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to input range, (+/-)		0.3 %	0.3 %	0.3 %	
• Current, relative to input range, (+/-)	0.3 %			0.3 %	0.3 %
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; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB	70 dB
• Common mode voltage, max.		10 V		10 V	10 V
• Common mode interference, min.		90 dB		90 dB	90 dB
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	No	No	No	No	No
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
• Limit value alarm	No	No	No	No	No
Diagnostic messages					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break	Yes; at 4 to 20 mA	No	No	Yes; at 4 to 20 mA	Yes; at 4 to 20 mA
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; at 1 to 5 V	No	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; Short-circuit of the encoder supply
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; green PWR LED	Yes; green PWR LED	Yes; Green 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	No	No	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; Green/red LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for applications according to AMS 2750				Yes; Declaration of Conformity, see online support entry 109757262	
Suitable for applications according to CQI-9				Yes	
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.		-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.		60 °C	60 °C	60 °C	60 °C
• vertical installation, min.		-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.		50 °C	50 °C	50 °C	50 °C

Technical specifications (continued)

Article number	6ES7134-6GF00-0AA1 ET 200SP, AI 8xI 2/4-wire Basic	6ES7134-6FB00-0BA1 ET 200SP, AI 2xU Standard, PU 1	6ES7134-6FF00-0AA1 ET 200SP, AI 8xU Basic	6ES7134-6HD01-0BA1 ET 200SP, AI 4xU/I 2-Wire ST, PU 1	6ES7134-6GB00-0BA1 ET 200SP, AI 2xI 2/4-wire ST, PU 1
Altitude during operation relating to sea level					
<ul style="list-style-type: none"> Installation altitude above sea level, max. 			2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	31 g	31 g	31 g	31 g	32 g
Article number	6ES7134-6GD01-0BA1 ET 200SP, AI 4xI 2/4-wire ST, PU 1	6ES7134-6TD00-0CA1 ET 200SP, AI 4xI 2-WIRE 4...20mA HART	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-Wire HF	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-Wire HS	
General information					
Product type designation	AI 4xI 2-/4-wire ST	AI 4xI 2-wire HART	AI 2xU/I 2-/4-wire HF	AI 2xU/I 2-/4-wire HS	
Product function					
<ul style="list-style-type: none"> I&M data Measuring range scalable Scalable measured values Adjustment of measuring range 	Yes; I&M0 to I&M3 No	Yes; I&M0 to I&M3 No	Yes; I&M0 to I&M3 No	Yes; I&M0 to I&M3 No No No	
Engineering with					
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated as of version STEP 7 configurable/integrated as of version PCS 7 configurable/integrated as of version PROFIBUS as of GSD version/GSD revision PROFINET as of GSD version/GSD revision 	V14 / - V5.6 and higher V8.1 SP1 One GSD file each, Revision 3 and 5 and higher GSDML V2.3	V13 SP1 V5.5 SP4 and higher V8.1 SP1 GSD Revision 5 GSDML V2.3	V13 V5.5 / - V8.1 SP1 GSD Revision 5 GSDML V2.3	V13 SP1 V5.5 SP3 / - GSD Revision 5 GSDML V2.3	
Operating mode					
<ul style="list-style-type: none"> Oversampling MSI 	No No	No No	No Yes	Yes; 2 channels per module No	
Supply voltage					
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; Differential inputs	4; Differential inputs	2; Differential inputs	2; Differential inputs	
<ul style="list-style-type: none"> For current measurement For voltage measurement 		4	2 2	2 2	
permissible input voltage for voltage input (destruction limit), max.			30 V	30 V	
permissible input current for current input (destruction limit), max.	50 mA	50 mA	50 mA	50 mA	
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)			125 µs	
Analog input with oversampling			No	Yes	
<ul style="list-style-type: none"> Values per cycle, max. Resolution, min. 				16 50 µs	
Standardization of measured values			Yes		

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications (continued)

Article number	6ES7134-6GD01-0BA1 ET 200SP, AI 4XI 2/4-wire ST, PU 1	6ES7134-6TD00-0CA1 ET 200SP, AI 4XI 2-WIRE 4...20MA HART	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-Wire HF	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-Wire HS
Input ranges (rated values), voltages				
• 0 to +10 V			Yes; 15 bit	Yes; 15 bit
• 1 V to 5 V			Yes; 15 bit	Yes; 13 bit
• -10 V to +10 V			Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -5 V to +5 V			Yes; 16 bit incl. sign	Yes; 15 bit incl. sign
Input ranges (rated values), currents				
• 0 to 20 mA	Yes; 16 bit incl. sign	No	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	Yes	No	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 15 bit	Yes; 15 bit + sign	Yes; 15 bit	Yes; 14 bit
Cable length				
• shielded, max.	1 000 m	800 m	1 000 m; 200 m for voltage measurement	1 000 m; 200 m for voltage measurement
Analog value generation for the inputs				
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)	Sigma Delta	Actual value encryption (successive approximation)
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; channel by channel	Yes	
• Integration time (ms)			67.5 / 22.5 / 18.75 / 10 / 5 / 2.5 / 1.25 / 0.625 ms	
• Basic conversion time, including integration time (ms)			68.03 / 22.83 / 19.03 / 10.28 / 5.23 / 2.68 / 1.43 / 0.730 ms	
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz	10 / 50 / 60 Hz	16.6 / 50 / 60 / 300 / 600 / 1 200 / 2 400 / 4 800	No
• Conversion time (per channel)	180 / 60 / 50 ms		68.2 / 23 / 19.2 / 10.45 / 5.40 / 2.85 / 1.6 / 0.9 ms	10 µs
• Basic execution time of the module (all channels released)			1 ms	
Smoothing of measured values				
• Number of smoothing levels	4; None; 4/8/16 times	4; None; 4/8/16 times	6; none; 2-/4-/8-/16-/32-fold	7; none; 2-/4-/8-/16-/32-/64-fold
• parameterizable	Yes	Yes	Yes	Yes
Encoder				
Connection of signal encoders				
• for voltage measurement	No	No	Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes	Yes	Yes
- Burden of 2-wire transmitter, max.	650 Ω		650 Ω	650 Ω
• for current measurement as 4-wire transducer	Yes		Yes	Yes
Errors/accuracies				
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input range, (+/-)			0.05 %; 0.1 % at SFU 4.8 kHz	0.2 %
• Current, relative to input range, (+/-)	0.3 %	0.3 %	0.05 %; 0.1 % at SFU 4.8 kHz	0.2 %
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.	70 dB	60 dB		
• Common mode voltage, max.	10 V		35 V	35 V
• Common mode interference, min.	90 dB		90 dB	90 dB

Technical specifications (continued)

Article number	6ES7134-6GD01-0BA1 ET 200SP, AI 4XI 2/4-wire ST, PU 1	6ES7134-6TD00-0CA1 ET 200SP, AI 4XI 2-WIRE 4...20mA HART	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-Wire HF	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-Wire HS
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	Yes	Yes
Filtering and processing time (TCI), min.			800 µs	80 µs
Bus cycle time (TDP), min.			1 ms	125 µs; Starting from firmware Version V2.0.1
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	No	Yes	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnostic messages				
• Monitoring the supply voltage	Yes	Yes	Yes	
• Wire-break	Yes; at 4 to 20 mA	Yes; channel by channel	Yes; Measuring range 4 to 20 mA only	Yes; channel-by-channel, at 4 to 20 mA only
• Short-circuit	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	Yes; channel-by-channel, at 1 to 5 V or for short-circuit in encoder supply	Yes; channel-by-channel, at 1 to 5 V or for current measuring ranges short-circuit in encoder supply
• Group error	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes; channel by channel	Yes	Yes
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes; Green 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 channel diagnostics	No	Yes; Red LED	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Green/red LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C		-30 °C	-30 °C
• horizontal installation, max.	60 °C		60 °C	60 °C
• vertical installation, min.	-30 °C		-30 °C	-30 °C
• vertical installation, max.	50 °C		50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m		2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	31 g	31 g	32 g	32 g

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications (continued)

Article number	6ES7134-6JF00-0CA1 ET 200SP, AI 8xRTD/TC 2-Wire HF	6ES7134-6JD00-0CA1 ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	6ES7134-6JD00-0DA1 ET 200SP, AI 4x TC HS
General information			
Product type designation	AI 8xRTD/TC 2-wire HF	AI 4xRTD/TC 2-/3-/4-wire HF	AI 4xTC HS
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Measuring range scalable			Yes
Engineering with			
• STEP 7 TIA Portal configurable/integrated as of version	V13	V12 SP1 / V13	V15 with HSP 265/integrated as of V15.1
• STEP 7 configurable/integrated as of version	V5.5 / -	V5.5 SP3 / V5.5 SP4	V5.5 SP3 or higher
• PCS 7 configurable/integrated as of version		V8.1 SP1	
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode			
• Oversampling	No	No	No
• MSI	No	No	Yes
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Analog inputs			
Number of analog inputs	8	4	4
• For voltage measurement	8	4	
• For resistance/resistance thermometer measurement	8	4	
• For thermocouple measurement	8	4	
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	0.7 mA; 1.7 mA for Cu10 sensors	
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); for line compensation in case of a three-wire connection, an additional cycle is necessary	5 ms; 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; °C/°F/K	Yes; °C/°F/K	Yes; °C/°F/K
Input ranges (rated values), voltages			
• -1 V to +1 V	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -250 mV to +250 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -50 mV to +50 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -80 mV to +80 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Input ranges (rated values), thermocouples			
• Type B	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type C	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type E	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type J	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type K	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type L	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type N	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type R	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type S	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type T	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type U	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign

Technical specifications (continued)

Article number	6ES7134-6JF00-0CA1 ET 200SP, AI 8xRTD/TC 2-Wire HF	6ES7134-6JD00-0CA1 ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	6ES7134-6JD00-0DA1 ET 200SP, AI 4x TC HS
Input ranges (rated values), resistance thermometer			
• Cu 10		Yes; 16 bit incl. sign	
• Ni 100	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• LG-Ni 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 120	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 200	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 500	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 100	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 200	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 500	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
Input ranges (rated values), resistors			
• 0 to 150 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 300 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 600 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 3000 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 6000 ohms	Yes; 15 bit	Yes; 15 bit	
• PTC	Yes; 15 bit	Yes; 15 bit	
Thermocouple (TC) Temperature compensation			
- parameterizable	Yes	Yes	Yes
Cable length			
• shielded, max.	200 m; 50 m with thermocouples	200 m; 50 m with thermocouples	200 m; 100 m for thermocouples
Analog value generation for the inputs			
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)
Integration and conversion time/resolution per channel			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes
• Basic conversion time, including integration time (ms)			
- additional processing time for wire-break check	2 ms; In the ranges resistance thermometers, resistors and thermocouples	2 ms; In the ranges resistance thermometers, resistors and thermocouples	1 ms
- additional power line wire-break check		2 ms; for 3/4 wire transducer (resistance thermometer and resistor)	
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz / off
• Conversion time (per channel)	180 / 60 / 50 ms	180 / 60 / 50 ms	180/60/50/1.25 ms
Smoothing of measured values			
• Number of smoothing levels	4; None; 4/8/16 times	4; None; 4/8/16 times	4; None; 4/8/16 times
• parameterizable	Yes	Yes	Yes
Encoder			
Connection of signal encoders			
• for voltage measurement	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes	Yes	
• for resistance measurement with three-wire connection	No	Yes	
• for resistance measurement with four-wire connection	No	Yes	

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications (continued)

Article number	6ES7134-6JF00-0CA1 ET 200SP, AI 8xRTD/TC 2-Wire HF	6ES7134-6JD00-0CA1 ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	6ES7134-6JD00-0DA1 ET 200SP, AI 4x TC HS
Errors/accuracies			
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input range, (+/-)	0.05 %	0.05 %	0.05 %; 0.2 % when SFU OFF
• Resistance, relative to input range, (+/-)	0.05 %	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
• Common mode voltage, max.	10 V	10 V	60 V; DC
• Common mode interference, min.	90 dB	90 dB	90 dB
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	No	No	No
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes	Yes
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			
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire-break	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel
• Group error	Yes	Yes	Yes
• Overflow/underflow	Yes; channel by channel	Yes; channel by channel	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 LED
Potential separation			
Potential separation channels			
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for applications according to AMS 2750			Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9			Yes; Based on AMS 2750 E
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.			-30 °C
• horizontal installation, max.			60 °C
• vertical installation, min.			-30 °C
• vertical installation, max.			50 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.			2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions			
Width	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
Weights			
Weight, approx.	32 g	30 g	33 g

Technical specifications (continued)

Article number	7MH4134-6LB00-0DA0 ET 200SP AI 2 X SG 4-/6-WIRE HS
General information	
Product type designation	AI 2xSG 4-/6-wire HS
Product function	
• I&M data	Yes; I&M0 to I&M3
• Measuring range scalable	Yes
• Scalable measured values	No
• Adjustment of measuring range	Yes; $\pm 0.5 \dots 320$ mV/V
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V14 SP1
• STEP 7 configurable/integrated as of version	V5.6
• PROFIBUS as of GSD version/ GSD revision	V03.01.105
• PROFINET as of GSD version/ GSD revision	GSDML V2.33
Operating mode	
• Oversampling	Yes; 2 channels per module
• MSI	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog inputs	
Number of analog inputs	2; Differential inputs
Cycle time (all channels), min.	100 μ s
Analog input with oversampling	Yes
• Values per cycle, max.	14
• Resolution, min.	100 μ s
Input ranges	
• Strain gauges (full bridges)	Yes
Cable length	
• shielded, max.	500 m
Analog value generation for the inputs	
Measurement principle	Sigma Delta
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	28 bit; 16 bits with oversampling
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f_1 in Hz	60 / 50 Hz / no
• Conversion time (per channel)	100 μ s
Smoothing of measured values	
• IIR low-pass filter frequency	0.01 ... 600 Hz
• IIR low-pass filter ordinal number	1 ... 4
• Notch filter frequency	0.1 ... 1 000 Hz
• Notch filter quality	5.00 ... 250.00
• Average value filter	0.1 ... 655.3 ms
Encoder	
Connection of signal encoders	
• For strain gauges (full bridges) with 4-conductor connection	Yes
• For strain gauges (full bridges) with 6-conductor connection	Yes
• Resistance of full bridge, min.	80 Ω
• Resistance of full bridge, max.	5 000 Ω

Article number	7MH4134-6LB00-0DA0 ET 200SP AI 2 X SG 4-/6-WIRE HS
Errors/accuracies	
Temperature coefficient, zero point	$\leq \pm 0.25$ μ V/K
Temperature coefficient, span, 4-conductor connection (referred to end value)	$\leq \pm 5$ ppm/K
Temperature coefficient, span, 6-conductor connection (referred to end value)	$\leq \pm 10$ ppm/K
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-) 0.05 %; See manual for details	
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Filtering and processing time (TCI), min.	87 μ s
Bus cycle time (TDP), min.	125 μ s
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
• Overflow/underflow	Yes
Diagnostics indication 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
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications (continued)

Article number	6ES7134-6PA01-0BD0 ET 200SP AI Energy Meter 400VAC ST	6ES7134-6PA20-0BD0 ET 200SP AI Energy Meter 480VAC ST	6ES7134-6PA00-0CU0 AI Energy Meter 480 VAC/CT HF	6ES7134-6PA20-0CU0 AI Energy Meter 480 VAC/RC HF
General information				
Product type designation	AI energy meter 400VAC ST	AI Energy Meter 480VAC ST	AI Energy Meter 480 VAC/CT HF, PU 1	AI Energy Meter 480 VAC/RC HF, PU 1
Product function				
• Voltage measurement	Yes	Yes	Yes	Yes
- without voltage transformer		Yes	Yes	Yes
- with voltage transformer	No	Yes	Yes	Yes
• Current measurement	Yes	Yes	Yes	Yes
- without current transformer	No	No	No	No
- with current transformer	Yes	Yes	Yes; 1 A or 5 A current transformer	No
- with Rogowski coil		No	No	Yes
- with current/voltage transformer		No	No	Yes; 333 mV interface
• Energy measurement	Yes	Yes	Yes	Yes
• Frequency measurement	Yes	Yes	Yes	Yes
• Power measurement	Yes	Yes	Yes	Yes
• Active power measurement	Yes	Yes	Yes	Yes
• Reactive power measurement	Yes	Yes	Yes	Yes
• Power factor measurement		Yes	Yes	Yes
• Active factor measurement		No	Yes	Yes
• Reactive power compensation		No	Yes	Yes
• Line analysis		No	Yes	Yes
- Monitoring of instantaneous and half-wave values			Yes	Yes
- THD measurement for current and voltage			Yes	Yes
- Harmonics for current and voltage			Yes	Yes
- Voltage dip (DIP)			Yes	Yes
- Voltage swell			Yes	Yes
• 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
• Isochronous mode	No	No	No	No
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1	V13 SP1	STEP 7 V15 or higher	STEP 7 V15 or higher
• STEP 7 configurable/integrated as of version	V5.5 SP4 and higher	V5.5 SP4 and higher	V5.5 SP3 or higher	V5.5 SP3 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/ GSD revision	V2.3	V2.3	V2.3	V2.3
Operating mode				
• Switching between operating modes in RUN			Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user
• cyclic measurement	Yes			
• acyclic measurement	Yes			
• Cyclic measured value access		Yes	Yes	Yes
• Acyclic measured value access	Yes	Yes	Yes	Yes
• Fixed measured value sets	Yes	Yes	Yes	Yes
• Freely definable measured value sets	No	Yes	Yes; For cyclic and acyclic measured value access	Yes; For cyclic and acyclic measured value access

Technical specifications (continued)

Article number	6ES7134-6PA01-0BD0 ET 200SP AI Energy Meter 400VAC ST	6ES7134-6PA20-0BD0 ET 200SP AI Energy Meter 480VAC ST	6ES7134-6PA00-0CU0 ET 200SP AI Energy Meter 480V AC/CT HF	6ES7134-6PA20-0CU0 ET 200SP AI Energy Meter 480V AC/RC HF
Installation type/mounting				
Mounting position	Any	Any	Any	Any
Supply voltage				
Design of the power supply	Supply via voltage measurement channel L1	Supply via voltage measurement channel L1	DC	DC
Type of supply voltage	100 - 240 V AC	AC 100 - 277 V	24 V DC	24 V DC
Line frequency				
• permissible range, lower limit	47 Hz	47 Hz		
• permissible range, upper limit	63 Hz	63 Hz		
Analog inputs				
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)
Cable length				
• shielded, max.			200 m	200 m
• unshielded, max.		200 m	200 m	30 m
Isochronous mode				
Isochronous operation (application synchronized up to terminal)		No	No	No
Interrupts/diagnostics/status information				
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	No	Yes	Yes	Yes
• Hardware interrupt	No	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)
Diagnostic messages				
• Line quality			Yes	Yes
• Supply voltage			Yes	Yes
• Hardware interrupt lost			Yes	Yes
• Parameter assignment error			Yes	Yes
• Module fault			Yes	Yes
• Channel not available			Yes	Yes
• Overflow/underflow			Yes	Yes
• Overload current			Yes	Yes
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes	Yes	Yes	Yes
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; red Fn LED	Yes; red Fn LED	Yes; red Fn LED	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Integrated Functions				
Measuring functions				
• Measuring procedure for voltage measurement	TRMS	TRMS	TRMS	TRMS
• Measuring procedure for current measurement	TRMS	TRMS	TRMS	TRMS
• Type of measured value acquisition	seamless	seamless	seamless	seamless
• Curve shape of voltage	Sinusoidal or distorted	Sinusoidal or distorted	Sinusoidal or distorted	Sinusoidal or distorted
• Buffering of measured variables	No	Yes	Yes	Yes
• Parameter length	38 byte	74 byte	128 byte	128 byte
• Bandwidth of measured value acquisition	2 kHz; Harmonics: 39 / 50 Hz, 32 / 60 Hz	2 kHz; Harmonics: 39 / 50 Hz, 32 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz

I/O SystemsSIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP**I/O modules > Analog input modules****Technical specifications (continued)**

Article number	6ES7134-6PA01-0BD0 ET 200SP AI Energy Meter 400VAC ST	6ES7134-6PA20-0BD0 ET 200SP AI Energy Meter 480VAC ST	6ES7134-6PA00-0CU0 ET 200SP AI Energy Meter 480V AC/CT HF	6ES7134-6PA20-0CU0 ET 200SP AI Energy Meter 480V AC/RC HF
Measuring range				
- Frequency measurement, min.	45 Hz	45 Hz	45 Hz	45 Hz
- Frequency measurement, max.	65 Hz	65 Hz	65 Hz	65 Hz
Measuring inputs for voltage				
- Measurable line voltage between phase and neutral conductor	230 V	277 V	300 V	300 V
- Measurable line voltage between the line conductors	400 V	480 V	519 V	519 V
- Measurable line voltage between phase and neutral conductor, min.	90 V	90 V	3 V	3 V
- Measurable line voltage between phase and neutral conductor, max.	264 V	293 V	300 V	300 V
- Measurable line voltage between the line conductors, min.	155 V	155 V	6 V	6 V
- Measurable line voltage between the line conductors, max.	460 V	508 V	519 V	519 V
- Measurement category for voltage measurement in accordance with IEC 61010-2-030	CAT II; CAT III in case of guaranteed protection level of 1.5 kV	CAT II; CAT III in case of guaranteed protection level of 1.5 kV	CAT II	CAT II
- Internal resistance line conductor and neutral conductor	3.4 MΩ	3.4 MΩ	1.5 MΩ	1.5 MΩ
- Power consumption per phase	20 mW	20 mW	60 mW; 300 V AC	60 mW; 300 V AC
- Impulse voltage resistance 1, 2/50μs	1 kV	1 kV	2.5 kV	2.5 kV
Measuring inputs for current				
- measurable relative current (AC), min.	5 %; Relative to the secondary rated current; 1 A, 5 A	1 %; Relative to the secondary rated current 5 A	1 %; Relative to the secondary rated current 5 A	
- measurable relative current (AC), max.	100 %; Relative to the secondary rated current; 1 A, 5 A	100 %; Relative to the secondary rated current 5 A	100 %; Relative to the secondary rated current 5 A	
- Continuous current with AC, maximum permissible	5 A	5 A	5 A; 6 A permanent thermal overload	
- Apparent power consumption per phase for measuring range 5 A	0.6 V·A	0.6 V·A	0.6 V·A	
- Rated value short-time withstand current restricted to 1 s	100 A	100 A	100 A	
- Input resistance measuring range 0 to 5 A	25 mΩ; At the terminal	25 mΩ; At the terminal	25 mΩ; At the terminal	
- Zero point suppression	Parameterizable: 20 ... 250 mA, default 50 mA	Parameterizable: 2 ... 250 mA, default 50 mA	0 ... 20%, referred to the nominal current	
- Surge strength	10 A; for 1 minute	10 A; for 1 minute	10 A; for 1 minute	
Measuring inputs for current (Rog. or I/U converter)				
- Measurable current at AC, max.				424 mV
- Continuous voltage, maximum permissible				2 V
- Rated value, short-time withstand voltage restricted to 1 s				30 V
- Input resistance				120 kΩ
- Zero point suppression				Yes; 0 ... 20%, referred to the nominal current
Accuracy class according to IEC 61557-12				
- Measured variable voltage	0.5	0,2	0,2	0,2
- Measured variable current	0.5	0,2	0,2	0,2
- Measured variable apparent power	1	0.5	0.5	0.5
- Measured variable active power	1	0.5	0.5	0.5
- Measured variable reactive power	1	1	1	1
- Measured variable power factor	0.5	0.5	0.5	0.5
- Measured variable active energy	1	0.5	0.5	0.5
- Measured variable reactive energy	2	1	1	1
- Measured variable neutral current		0.5; calculated	0,2	0,2

Technical specifications (continued)

Article number	6ES7134-6PA01-0BD0 ET 200SP AI Energy Meter 400VAC ST	6ES7134-6PA20-0BD0 ET 200SP AI Energy Meter 480VAC ST	6ES7134-6PA00-0CU0 ET 200SP AI Energy Meter 480V AC/CT HF	6ES7134-6PA20-0CU0 ET 200SP AI Energy Meter 480V AC/RC HF
Accuracy class according to IEC 61557-12 (cont.)				
- Measured variable phase angle	±1 °; not covered by IEC 61557-12	±1 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12
- Measured variable frequency	0.05	0.05	0.05	0.05
- Measured variable harmonic			1	1
- Measured variable THDU			1	1
- Measured variable THDI			1	1
Accuracy class line analysis acc. to IEC 61000-4-30				
- Measured variable voltage			Class S	Class S
- Measured variable current			Class S	Class S
- Measured variable frequency			Class S	Class S
- Measured variable voltage interruption			Class S	Class S
- Measured variable voltage dip and swell			Class S	Class S
- Measured variable harmonic voltage			Class S	Class S
- Measured variable harmonic current			Class S	Class S
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes; 3 700V AC (type test) CAT III	Yes; 3 700V AC (type test) CAT III	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	0 °C	0 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.			3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
• Ambient air temperature-barometric pressure-altitude		On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m		
Dimensions				
Width	20 mm	20 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight (without packaging)	45 g	45 g	45 g	45 g
Other				
Data for selecting a voltage transformer				
• Secondary side, max.		296 V	300 V	300 V
Data for selecting a current transformer				
• Burden power current transformer x/1A, min.	As a function of cable length and cross section, see device manual	As a function of cable length and cross section, see device manual	As a function of cable length and cross section, see device manual	
• Burden power current transformer x/5A, min.	As a function of cable length and cross section, see device manual	As a function of cable length and cross section, see device manual	As a function of cable length and cross section, see device manual	

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog input modules

Ordering data

Analog input modules

Type of delivery:

Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

The number of modules required is the number of modules ordered.

The type of packaging is chosen by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.

Analog input module
AI 8xI 2/4-wire BA, BU type A0 or A1, color code CC01

6ES7 134-6GF00-0AA1

Analog input module
AI 2xU ST, BU type A0 or A1, color code CC00

6ES7134-6FB00-0BA1

Analog input module
AI 8xU BA, BU type A0 or A1, color code CC02

6ES7 134-6FF00-0AA1

Analog input module
AI 4xU/I 2-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%

- 1 unit
- 10 units

6ES7134-6HD01-0BA1
6ES7134-6HD01-2BA1

Analog input module
AI 2xI 2/4-wire Standard, BU type A0 or A1, color code CC05, 16-bit

- 1 unit

6ES7134-6GB00-0BA1

Analog input module
AI 4xI 2/4-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%

- 1 unit
- 10 units

6ES7134-6GD01-0BA1
6ES7134-6GD01-2BA1
6ES7134-6TD00-0CA1

Analog input module
AI 4xI 2-wire 4 ... 20 mA HART, BU type A0 or A1, color code CC03

6ES7134-6HB00-0CA1

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

6ES7134-6HB00-0DA1

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

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

- 1 unit
- 10 units

6ES7134-6JF00-0CA1
6ES7134-6JF00-2CA1

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

- 1 unit
- 10 units

6ES7134-6JD00-0CA1
6ES7134-6JD00-2CA1
6ES7134-6JD00-0DA1

Analog input module
AI 4xTC High Speed, BU type A0 or A1, color code CC00, 16-bit, channel diagnostics

7MH4134-6LB00-0DA0

Analog input module
AI 2x SG, 4/6-wire High Speed, BU type A0, color code CC00, channel diagnostics, 28/16-bit, ±0.05%, for DMS full bridges; for connecting force and torque sensors

6ES7134-6PA01-0BD0

Analog input module
AI Energy Meter Standard, 400 V AC, BU type D0

6ES7134-6PA20-0BD0

Analog input module
AI Energy Meter Standard, 480 V AC, BU type D0

6ES7134-6PA00-0CU0

Analog input module
AI Energy Meter 480 V AC/CT High Feature, for 1 A or 5 A current transformers, with line analysis functions, channel diagnostics; BU type U0

6ES7134-6PA20-0CU0

Analog input module
AI Energy Meter 480 V AC/RT High Feature, for Rogowski coils or 333 mV current/voltage transformers, with line analysis functions, channel diagnostics; BU type U0

Usable type A0 BaseUnits

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 push-in 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+A0+2D

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

- 1 unit
- 10 units

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

2BU15-P16+A0+2DB

Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- 1 unit

6ES7193-6BP60-0DA0

Ordering data	Article No.	Ordering data	Article No.
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0	Potential distributor modules PotDis BU PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	6ES7193-6UP00-ODP1 6ES7193-6UP00-OBP1
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in 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	PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	6ES7193-6UP00-ODP2 6ES7193-6UP00-OBP2
2BU15-P16+A0+2B Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group <ul style="list-style-type: none"> • 1 unit 	6ES7193-6BP60-0BA0	PotDis TB PotDis TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	6ES7193-6TP00-0TP0
Usable type A1 BaseUnits (temperature detection)		PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	6ES7193-6TP00-0TP1
BU15-P16+A0+12D/T BU type A1; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	6ES7193-6BP40-0DA1	PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	6ES7193-6TP00-0TP2
BU15-P16+A0+2D/T BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6ES7193-6BP00-0DA1	PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	6ES7193-6TP00-0TN0
BU15-P16+A0+12B/T BU type A1; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	6ES7193-6BP40-0BA1	Accessories	
BU15-P16+A0+2B/T BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	6ES7193-6BP00-0BA1	Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0
Usable type D0 BaseUnits		Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0
BU20-P12+A0+0B BU type D0; BaseUnit with 12 push-in terminals, without AUX terminals, bridged to the left	6ES7193-6BP00-0BD0	500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0
Usable type U0 BaseUnits		1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AA0
BU20-P16+A0+2D BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP00-0DU0 6ES7193-6BP00-2DU0	1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AG0
BU20-P16+A0+2B BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP00-0BU0 6ES7193-6BP00-2BU0	BU cover For covering empty slots (gaps); 5 units <ul style="list-style-type: none"> • 15 mm wide • 20 mm wide 	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0
		Shield connection 5 shield supports and 5 shield terminals	6ES7193-6SC00-1AM0

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SIMATIC ET 200SP**I/O modules > Analog input modules****Ordering data****Article No.****Color-coded labels**

Color code CC00,
for 16 push-in terminals,
BU type A0, A1,
gray (terminals 1 to 8),
red (terminals 9 to 16); 10 units

6ES7193-6CP00-2MA0

Color code CC01,
for 16 push-in terminals,
BU type A0, A1,
gray (terminals 1 to 8),
red (terminals 9 to 16); 10 units

6ES7193-6CP01-2MA0

Color code CC01,
for 16 push-in terminals,
BU type A0, A1,
gray (terminals 1 to 8),
red (terminals 9 to 16); 50 units

6ES7193-6CP01-4MA0

Color code CC02,
for 16 push-in terminals,
BU type A0, A1,
gray (terminals 1 to 8),
blue (terminals 9 to 16); 10 units

6ES7193-6CP02-2MA0

Color code CC02,
for 16 push-in terminals,
BU type A0, A1,
gray (terminals 1 to 8),
blue (terminals 9 to 16); 50 units

6ES7193-6CP02-4MA0

Color code CC03,
for 16 push-in 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 push-in 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 additional terminals,
BU type A1,
red (terminals 1B to 5B),
blue (terminals 1C to 5C); 10 units

6ES7193-6CP74-2AA0**Article No.****Color-coded labels for PotDis BU**

Color code CC62,
for 16 push-in terminals,
PotDis BU type P1,
red (terminals 1 to 16); 10 units

6ES7193-6CP62-2MA0

Color code CC63,
for 16 push-in terminals,
PotDis BU type P2,
blue (terminals 1 to 16); 10 units

6ES7193-6CP63-2MA0**Color-coded labels for PotDis TB**

Color code CC10,
for 18 push-in terminals,
PotDis TB, gray (terminals 1 to 18);
10 units

6ES7193-6CP10-2MT0

Color code CC11,
for 18 push-in terminals,
PotDis TB, yellow-green
(terminals 1 to 18); 10 units

6ES7193-6CP11-2MT0

Color code CC12,
for 18 push-in terminals,
PotDis TB, type P1 and BR,
red (terminals 1 to 18); 10 units

6ES7193-6CP12-2MT0

Color code CC13,
for 18 push-in terminals,
PotDis TB, type P2 and BR,
blue (terminals 1 to 18); 10 units

6ES7193-6CP13-2MT0

Overview



- 2 and 4-channel analog output (AQ) modules
- Apart from the standard type of delivery as an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital output modules offer:

- Function classes Standard, High Feature and High-Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)

- Option for connecting current and voltage actuators
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - Oversampling operating mode (n-fold equidistant output of an analog value within one PN cycle and thus the precisely timed output of an analog value or a sequence of analog values)
 - Isochronous mode (simultaneous equidistant output of analog values)
 - Output of substitute value in the event of interruptions to communication (shutdown, output adjustable substitute value, or keep last value)
 - Calibration during runtime
 - Re-parameterization during operation
 - Firmware update
 - Diagnosis of wire break, short circuit, overflow, underflow
 - Value status (optional binary validity information of the analog signal in the process image)
 - Supports the PROFlenergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shielding terminal

A quick and clear comparison of the functions of the AQ modules is offered by the TIA Selection Tool.

Overview of analog output modules

Analog output	PU	Article No.	CC code	BU type
AQ 2 x U ST	1	6ES7135-6FB00-0BA1	CC00	A0, A1
AQ 2 x I ST	1	6ES7135-6GB00-0BA1	CC00	A0, A1
AQ 4 x U/I ST	1	6ES7135-6HD00-0BA1	CC00	A0, A1
AQ 2 x U/I HF	1	6ES7135-6HB00-0CA1	CC00	A0, A1
AQ 2xU/I HS	1	6ES7135-6HB00-0DA1	CC00	A0, A1

With two operating modes:

- High-speed isochronous AQ
- Oversampling

I/O SystemsSIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP**I/O modules > Analog output modules****Overview** (continued)

Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type A1 • New load group (light) • With temperature sensor • 16 push-in terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0DA1	CC01 to CC05	CC74
BU type A1 • New load group (light) • With temperature sensor • 16 push-in terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0DA1	CC01 to CC05	--
BU type A1 • Forwarding of load group (dark) • With temperature sensor • 16 push-in terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0BA1	CC01 to CC05	CC74
BU type A1 • Forwarding of load group (dark) • With temperature sensor • 16 push-in terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0BA1	CC01 to CC05	--

Overview (continued)Overview of potential distributor modules

Potential distributor module	PU	Article No.	CC codes for push-in terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-ODP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	1	6ES7193-6UP00-OBP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-ODP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	1	6ES7193-6UP00-OBP2	CC00, CC63
PotDis TB Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-OTP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-OTP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-OTP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-OTN0	CC10

Technical specifications

Article number	6ES7135-6FB00-0BA1	6ES7135-6GB00-0BA1	6ES7135-6HD00-0BA1	6ES7135-6HB00-0DA1	6ES7135-6HB00-0CA1
	ET 200SP, AQ 2xU Standard, PU 1	ET 200SP, AQ 2xI Standard, PU 1	ET 200SP, AQ 4xU/I ST	ET 200SP, AQ 2 X U/I High Speed	ET 200SP, AQ 2 X U/I High Feature
General information					
Product type designation	AQ 2xU ST	AQ 2xI ST	AQ 4xU/I ST	AQ 2xU/I HS	AQ 2xU/I HF
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
• Output range scalable	No	No	No		
Engineering with					
• STEP 7 TIA Portal configurable/integrated as of version	V13 SP1 / -	V13 SP1 / -	V11 SP2 / V13	V13 SP1	V13 / V13
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PCS 7 configurable/integrated as of version			V8.1 SP1		V8.1 SP1
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode					
• Oversampling	No	No	No	Yes; 2 channels per module	No
• MSO	No	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog output modules

Technical specifications (continued)

Article number	6ES7135-6FB00-0BA1 ET 200SP, AQ 2xU Standard, PU 1	6ES7135-6GB00-0BA1 ET 200SP, AQ 2xI Standard, PU 1	6ES7135-6HD00-0BA1 ET 200SP, 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 outputs					
Number of analog outputs	2	2	4	2	2
Cycle time (all channels), min.	1 ms	1 ms	5 ms	125 µs	750 µs
Analog output with oversampling	No	No	No	Yes	Yes
• Values per cycle, max.				16	
• Resolution, min.				45 µs; (2 channels), 35 µs (1 channel)	
Output ranges, voltage					
• 0 to 10 V	Yes; 15 bit		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• 1 V to 5 V	Yes; 13 bit		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	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	Yes; 16 bit incl. sign
Output ranges, current					
• 0 to 20 mA		Yes; 15 bit	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	Yes; 16 bit incl. sign
• 4 mA to 20 mA		Yes; 14 bit	Yes; 14 bit	Yes; 14 bit	Yes; 14 bit
Connection of actuators					
• for voltage output two-wire connection	Yes		Yes	Yes	Yes
• for voltage output four-wire connection	No		Yes	Yes	Yes
• for current output two-wire connection		Yes	Yes	Yes	Yes
Load impedance (in rated range of output)					
• with voltage outputs, min.	2 kΩ		2 kΩ	2 kΩ	2 kΩ
• with voltage outputs, capacitive load, max.	1 µF		1 µF	1 µF	1 µF
• with current outputs, max.		500 Ω	500 Ω	500 Ω	500 Ω
• with current outputs, inductive load, max.		1 mH	1 mH	1 mH	1 mH
Cable length					
• shielded, max.	200 m	1 000 m	1 000 m; 200 m for voltage output	1 000 m; 200 m for voltage output	1 000 m; 200 m for voltage output
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	16 bit	16 bit
Settling time					
• for resistive load	0.1 ms	0.1 ms; Typical value	0.1 ms	0.05 ms	0.05 ms
• for capacitive load	1 ms		1 ms	0.05 ms; Max. 47 nF and 20 m cable length	0.05 ms; Max. 47 nF and 20 m cable length
• for inductive load		0.5 ms	0.5 ms	0.05 ms	0.05 ms
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to output range, (+/-)	0.3 %	0.3 %	0.3 %	0.1 %	0.1 %
• Current, relative to output range, (+/-)	0.3 %	0.3 %	0.3 %	0.1 %	0.1 %
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	No	No	No	Yes	Yes
Execution and activation time (TCO), min.				70 µs	500 µs
Bus cycle time (TDP), min.				125 µs	750 µs

Technical specifications (continued)

Article number	6ES7135-6FB00-0BA1 ET 200SP, AQ 2xU Standard, PU 1	6ES7135-6GB00-0BA1 ET 200SP, AQ 2xI Standard, PU 1	6ES7135-6HD00-0BA1 ET 200SP, 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
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostic messages					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break		Yes	Yes	Yes; channel-by-channel, only for output type "current"	Yes; channel-by-channel, only for output type "current"
• Short-circuit	Yes		Yes	Yes; channel-by-channel, only for output type "voltage"	Yes; channel-by-channel, only for output type "voltage"
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	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	No	No	No	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
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	0 °C	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C; Observe derating	60 °C	60 °C
• vertical installation, min.	0 °C	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C; Observe derating	50 °C	50 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.		2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	31 g	31 g	31 g	31 g	31 g

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog output modules

Ordering data

Analog output modules

Analog output module
AQ 2xU Standard, BU type A0 or
A1, color code CC00, 16-bit

6ES7135-6FB00-0BA1

Analog output module
AQ 2xI Standard, BU type A0 or A1,
color code CC00, 16-bit

6ES7135-6GB00-0BA1

Analog output module
AQ 4xU/I Standard,
BU type A0 or A1,
color code CC00, 16-bit, ± 0.3%

6ES7135-6HD00-0BA1

Analog output module
AQ 2xU/I High Feature,
BU type A0 or A1,
color code CC00, 16-bit, ±0.1%

6ES7135-6HB00-0CA1

Analog output module
AQ 2xU/I High Speed,
BU type A0 or A1,
color code CC00, 16-bit, ±0.3%

6ES7135-6HB00-0DA1

Usable type A0 BaseUnits

Type of delivery:
Apart from the standard type of
delivery in an individual package,
selected BaseUnits are also avail-
able in a pack of 10 units. The pack
of 10 units enables the amount of
waste to be reduced considerably,
as well as saving the time and cost
of unpacking individual modules.

The number of modules required is
the number of modules ordered.
The type of packaging is chosen by
selecting the article number. Packs
of 10 can therefore only be ordered
in integer multiples of 10.

BU15-P16+A10+2D

BU type A0; BaseUnit (light)
with 16 push-in 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+A0+2D

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

- 1 unit
- 10 units

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

2BU15-P16+A0+2DB

Double BaseUnit for holding
2 I/O modules;
BU type A0; BaseUnit (light/dark)
with 16 push-in terminals to the
module; for starting a new load
group (max. 10 A)

- 1 unit

6ES7193-6BP60-0DA0

Article No.

BU15-P16+A10+2B

BU type A0; BaseUnit (dark)
with 16 push-in 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

BU15-P16+A0+2B

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

- 1 unit
- 10 units

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

2BU15-P16+A0+2B

Double BaseUnit for holding
2 I/O modules;
BU type A0; BaseUnit (dark/dark)
with 16 push-in terminals to the
module; for continuing the load
group

- 1 unit

6ES7193-6BP60-0BA0

Usable type A1 BaseUnits (temperature detection)

BU15-P16+A0+12D/T

BU type A1; BaseUnit (light)
with 16 push-in terminals (1 ... 16)
to the module and 2x5 internally
jumpered additional terminals
(1 B to 5 B and 1 C to 5 C);
for starting a new load group
(max. 10 A)

6ES7193-6BP40-0DA1

BU15-P16+A0+2D/T

BU type A1; BaseUnit (light) with
16 push-in terminals to the module;
for starting a new load group
(max. 10 A)

6ES7193-6BP00-0DA1

BU15-P16+A0+12B/T

BU type A1; BaseUnit (dark)
with 16 push-in terminals (1 ... 16)
to the module and 2x5 internally
jumpered additional terminals
(1 B to 5 B and 1 C to 5 C);
for continuing the load group

6ES7193-6BP40-0BA1

BU15-P16+A0+2B/T

BU type A1; BaseUnit (dark) with
16 push-in terminals to the module;
for continuing the load group

6ES7193-6BP00-0BA1

Ordering data	Article No.	Article No.
Potential distributor modules		Shield connection
PotDis BU		5 shield supports and 5 shield terminals
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	6ES7193-6UP00-ODP1	Color-coded labels
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	6ES7193-6UP00-OBP1	Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	6ES7193-6UP00-ODP2	Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	6ES7193-6UP00-OBP2	Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units
PotDis TB		Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units
PotDis TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	6ES7193-6TP00-OTP0	Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	6ES7193-6TP00-OTP1	Color-coded labels for PotDis BU
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	6ES7193-6TP00-OTP2	Color code CC62, for 16 push-in terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	6ES7193-6TP00-OTN0	Color code CC63, for 16 push-in terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units
Accessories		Color-coded labels for PotDis TB
Equipment labeling plate	6ES7193-6LF30-0AW0	Color code CC10, for 18 push-in terminals, PotDis TB, gray (terminals 1 to 18); 10 units
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter		Color code CC11, for 18 push-in terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units
Labeling strips		Color code CC12, for 18 push-in terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	Color code CC13, for 18 push-in terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AA0	
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AG0	
BU cover		
For covering empty slots (gaps); 5 units		
• 15 mm	6ES7133-6CV15-1AM0	
• 20 mm	6ES7133-6CV20-1AM0	

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS digital inputs

Overview



- 4, 8 and 16-channel digital input (DI) modules

For different requirements, the digital input modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DI (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with additional potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)
- Option of connecting sensors compliant with IEC 61131 type 1, 2 or 3 (module-dependent) for rated voltages of up to 24 V DC or 230 V AC
- PNP (sink input) and NPN (source input) versions
- Clear labeling on front of module

- LEDs for diagnostics, status, supply voltage and faults (e.g. wire break/short-circuit)
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
 - Counting operating mode (multi-channel counter for pulse generators with 32-bit counting width and up to 10 kHz counting frequency)
 - Oversampling operating mode (n-fold equidistant acquisition of digital values within one PN cycle for increasing the time resolution for slow CPU cycles)
 - Parameterizable input delay time
 - Isochronous mode (simultaneous equidistant reading of all input channels)
 - Hardware interrupt pulse stretching
 - Re-parameterization during operation
 - Firmware update
 - Diagnosis of wire break and short-circuit (on channel or module basis)
 - Value status (optional binary validity information of the input signal in the process image)
 - Supports the PROFenergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shielding terminal

A quick and clear comparison of the functions of the different DI modules is offered by the TIA Selection Tool.

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	6AG1131-6BF61-7AA0	6AG1131-6BF01-7BA0	6AG1131-6BH01-7BA0
Based on	6ES7131-6BF61-0AA0 SIPLUS ET 200SP DI 8x24VDC SOURCE BA	6ES7131-6BF01-0BA0 SIPLUS ET 200SP DI 8x24VDC ST	6ES7131-6BH01-0BA0 SIPLUS ET 200SP DI 16x24VDC ST
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)

Technical specifications (continued)

Article number	6AG1131-6BF61-7AA0	6AG1131-6BF01-7BA0	6AG1131-6BF00-7CA0	6AG1131-6BF01-7BA0
Based on	6ES7131-6BF61-0AA0 SIPLUS ET 200SP DI 8x24VDC SOURCE BA	6ES7131-6BF01-0BA0 SIPLUS ET 200SP DI 8x24VDC ST	6ES7131-6TF00-0CA0 SIPLUS ET 200SP DI 8xNAMUR HF	6ES7131-6BH01-0BA0 SIPLUS ET 200SP DI 16x24VDC ST
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	6AG1131-6BF00-7CA0	6AG1131-6FD01-7BB1	6AG1131-6TF00-7CA0	6AG1131-6CF00-7AU0
Based on	6ES7131-6BF00-0CA0 SIPLUS ET 200SP DI 8x24VDC HF	6ES7131-6FD01-0BB1 SIPLUS ET 200SP DI 4X120...230VAC ST	6ES7131-6TF00-0CA0 SIPLUS ET 200SP DI 8xNAMUR HF	6ES7131-6CF00-0AU0 SIPLUS ET 200SP DI 8x48VUC BA
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; > +60 °C encoder supply output current max. 350 mA per channel	70 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 4 (no adjacent points)	70 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	2 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS digital inputs

Technical specifications (continued)

Article number	6AG1131-6BF00-7CA0	6AG1131-6FD01-7BB1	6AG1131-6TF00-7CA0	6AG1131-6CF00-7AU0
Based on	6ES7131-6BF00-0CA0 SIPLUS ET 200SP DI 8x24VDC HF	6ES7131-6FD01-0BB1 SIPLUS ET 200SP DI 4X120...230VAC ST	6ES7131-6TF00-0CA0 SIPLUS ET 200SP DI 8XNAMUR HF	6ES7131-6CF00-0AU0 SIPLUS ET 200SP DI 8x48VUC BA
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 in bedewed state), horizontal installation	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
<ul style="list-style-type: none"> Coatings for printed circuit board assemblies acc. to EN 61086 Protection against fouling acc. to EN 60664-3 Military testing according to MIL-I-46058C, Amendment 7 Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A 	Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS digital outputs

Overview



- 4, 8 and 16-channel DQ modules
- 4-channel RQ modules
- BaseUnits for single conductor or multiple-conductor connection
- Function classes Basic, Standard, High Feature and High-Speed as well as fail-safe DQ and RQ
- Clear labeling on front of module
- LEDs for diagnostics, status and errors
- Individual system-integrated load group formation with self-assembling potential multi-terminal busbars (power module not required for ET 200SP)
- Electronically readable rating plate (I&M data)
- Additional operating modes in some cases
- Optional accessories:
 - Labeling strips
 - Equipment marking label
 - Color-coded label with module-specific CC code
 - Shielding terminal

Overview of digital output modules

Digital output	PU	Article No.	CC code	BU type
DQ 16 x 24 V DC/0.5 A ST	1	6AG1132-6BH01-7BA0	CC00	A0
DQ 8 x 24 V DC/0.5 A SNK BA	1	6AG1132-6BF61-7AA0	CC01	A0
DQ 8 x 24 V DC/0.5 A ST	1	6AG1132-6BF01-7BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	1	6AG1132-6BF00-7CA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	1	6AG1132-6BD20-7BA0	CC02	A0
DQ 4 x 24 V DC/2 A HF	1	6AG1132-6BD20-7CA0	CC02	A0
DQ 4 x 24 ... 230 V AC/2 A HF	1	6AG1132-6FD00-7CU0	CC20	U0
With two operating modes: • DQ • PC: Power control via phase angle, half-wave or full-wave control				
RQ 4 x 24 V UC/2 A CO ST	1	6AG1132-6GD51-7BA0	--	A0
RQ 4 x 120 V DC-230 V AC/5 A NO ST	1	6AG1132-6HD01-7BB1	--	B0, B1

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	6AG1132-6BF61-7AA0	6AG1132-6BD20-7BA0	6AG1132-6BF01-7BA0
Based on	6ES7132-6BF61-0AA0 SIPLUS ET 200SP DQ 8x24VDC/0.5A SNK BA	6ES7132-6BD20-0BA0 SIPLUS ET200SP DQ 4x24VDC/2A ST	6ES7132-6BF01-0BA0 SIPLUS ET 200SP DQ 8x24VDC/0.5A ST
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	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
• vertical installation, min.		-40 °C; = Tmin	
• vertical installation, max.		50 °C; = Tmax	
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS digital outputs

Technical specifications (continued)

Article number	6AG1132-6BH01-7BA0	6AG1132-6BF00-7CA0	6AG1132-6GD51-7BA0
Based on	6ES7132-6BH01-0BA0 SIPLUS ET 200SP DQ 16x24VDC/0,5A ST	6ES7132-6BF00-0CA0 SIPLUS ET 200SP DQ 8X24VDC/0,5A HF	6ES7132-6GD51-0BA0 SIPLUS ET 200SP RQ 4x24VDC/2A CO ST
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. total current 1 A	70 °C; = Tmax; > +60 °C max. total current 1.0 A	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. aggregate current 2 A per group
• vertical installation, min.		-40 °C; = Tmin	
• vertical installation, max.		50 °C; = Tmax	
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna)
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Technical specifications (continued)

Article number	6AG1132-6HD01-7BB1	6AG1132-6BD20-7CA0	6AG1132-6FD00-7CU0
Based on	6ES7132-6HD01-0BB1 SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A	6ES7132-6BD20-0CA0 SIPLUS ET 200SP DQ 4X24VDC/2A HF	6ES7132-6FD00-0CU0 SIPLUS ET 200SP DQ 4X24...230VAC/2A HF
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. continuous current of 3 A per relay	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. total current 1 A	70 °C; = Tmax
• vertical installation, min.	-40 °C; in all other mounting positions		
• vertical installation, max.	50 °C; in all other mounting positions		
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	3 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS digital outputs

Ordering data	Article No.	Article No.
SIPLUS digital output modules (Extended temperature range and exposure to media) Digital output module DQ 8x24 V DC/0.5 A sink output, Basic, BU type A0, color code CC01 Digital output module DQ 4x24 V DC/2 A Standard, BU type A0, color code CC02 Digital output module DQ 8x24 V DC/0.5 A Standard, BU type A0, color code CC02 Digital output module DQ 8x24 V DC/0.5 A High Feature, BU type A0, color code CC02 Digital output module DQ 16x24 V DC/0.5 A Standard, BU type A0, color code CC00 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 Signal relay module RQ CO 4x24 V UC/2 A Standard, changeover contact, BU type A0, color code CC00 Relay module RQ NO 4x120 V DC-230 V AC/5 A Standard, NO contact, BU type B0, B1 Digital output module DQ 4x24 V AC ... 230 V AC/2 A High Feature for BU type U0, color code CC20, 2 operating modes: DQ and PC (power control via phase angle, half-wave and full-wave control)	6AG1132-6BF61-7AA0 6AG1132-6BD20-7BA0 6AG1132-6BF01-7BA0 6AG1132-6BF00-7CA0 6AG1132-6BH01-7BA0 6AG1132-6BD20-7CA0 6AG1132-6GD51-7BA0 6AG1132-6HD01-7BB1 6AG1132-6FD00-7CU0	6AG1193-6BP20-7BA0 (Extended temperature range and exposure to media) BU type A0; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group 6AG1193-6BP00-7BA0 (Extended temperature range and exposure to media) BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group 6AG1193-6BP20-7BB0 (Extended temperature range and exposure to media) BU type B0; BaseUnit (dark) with 12 push-in terminals (1...12) to the module and an additional 4 internally jumpered add-on terminals (1 A to 4 A); for continuing the load group; 1 unit 6AG1193-6BP20-7BB1 (Extended temperature range and exposure to media) BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the load group; 1 unit 6AG1193-6BP00-7DU0 (Extended temperature range and exposure to media) BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)
Usable SIPLUS BaseUnits BU15-P16+A10+2D (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 push-in terminals (1...16) to the module and additionally 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	6AG1193-6BP20-7DA0	6AG1193-6BP00-7BU0 (Extended temperature range and exposure to media) BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group Accessories See SIMATIC ET 200SP, digital output modules, page 9/42
BU15-P16+A0+2D (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA0	

Overview



- 2, 4 and 8-channel AI modules
- Measuring ranges for current, voltage, thermocouples, resistance thermometer, resistor and PTC
- BaseUnits for 2, 3 and 4-conductor connection
- Function classes Basic, Standard, High Feature and High Speed
- Clear labeling on front of module
- LEDs for diagnostics, status and errors
- Individual system-integrated load group formation with self-assembling potential multi-terminal busbars (power module not required for ET 200SP)
- Electronically readable rating plate (I&M data)
- Additional operating modes in some cases
- Optional accessories:
 - Labeling strips
 - Equipment marking label
 - Color-coded label with module-specific CC code
 - Shielding terminal

Overview of SIPLUS analog input modules

Analog input	PU	Article No.	CC code	BU type
AI 8 x U BA	1	6AG1134-6FF00-2AA1	CC02	A0, A1
AI 4 x U/I 2-wire ST	1	6AG1134-6HD01-7BA1	CC03	A0, A1
AI 4 x I 2/4-wire ST	1	6AG1134-6GD01-7BA1	CC03	A0, A1
AI 4 x I 2-wire 4 ... 20 mA HART	1	6AG1134-6TD00-2CA1	CC03	A0, A1
AI 2 x U/I 2/4-wire HF	1	6AG1134-6HB00-2CA1	CC05	A0, A1
AI 2xU/I 2/4-wire HS	1	6AG1134-6HB00-2DA1	CC00	A0, A1
With two operating modes: • High-speed isochronous AI • Oversampling				
AI 8 x RTD/TC 2-wire HF	1	6AG1134-6JF00-2CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	1	6AG1134-6JD00-2CA1	CC00	A0, A1
AI Energy Meter 480 V AC ST	1	6AG1134-6PA20-7BD0	--	D0

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

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS analog inputs

Technical specifications

Article number	6AG1134-6FF00-2AA1	6AG1134-6HD01-7BA1	6AG1134-6GD01-7BA1	6AG1134-6TD00-2CA1
Based on	6ES7134-6FF00-0AA1 SIPLUS ET 200SP AI 8xU BASIC	6ES7134-6HD01-0BA1 SIPLUS ET 200SP AI 4xU/I 2-w ST	6ES7134-6GD01-0BA1 SIPLUS ET 200SP AI 4xI 2-/4-w ST	6ES7134-6TD00-0CA1 SIPLUS ET 200SP AI 4XI 2-WIRE 4...20MA H
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	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; = Tmax
• vertical installation, min.		-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.		50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Technical specifications (continued)

Article number	6AG1134-6FF00-2AA1	6AG1134-6HD01-7BA1	6AG1134-6GD01-7BA1	6AG1134-6TD00-2CA1
Based on	6ES7134-6FF00-0AA1 SIPLUS ET 200SP AI 8xU BASIC	6ES7134-6HD01-0BA1 SIPLUS ET 200SP AI 4xU/I 2-w ST	6ES7134-6GD01-0BA1 SIPLUS ET 200SP AI 4xI 2-/4-w ST	6ES7134-6TD00-0CA1 SIPLUS ET 200SP AI 4XI 2-WIRE 4...20MA H
Conformal coating				
<ul style="list-style-type: none"> Coatings for printed circuit board assemblies acc. to EN 61086 Protection against fouling acc. to EN 60664-3 Military testing according to MIL-I-46058C, Amendment 7 Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A 	<ul style="list-style-type: none"> Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A 	<ul style="list-style-type: none"> Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A 	<ul style="list-style-type: none"> Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A 	<ul style="list-style-type: none"> Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A
Article number	6AG1134-6HB00-2CA1	6AG1134-6HB00-2DA1	6AG1134-6JF00-2CA1	6AG1134-6JD00-2CA1
Based on	6ES7134-6HB00-0CA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	6ES7134-6HB00-0DA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	6ES7134-6JF00-0CA1 SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	6ES7134-6JD00-0CA1 SIPLUS ET 200SP AI 4xRTD/TC HF
Ambient conditions				
Ambient temperature during operation				
<ul style="list-style-type: none"> horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. 	<ul style="list-style-type: none"> -40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C 60 °C; = Tmax 	<ul style="list-style-type: none"> -40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C 60 °C; = Tmax 	<ul style="list-style-type: none"> -40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C 60 °C; = Tmax -40 °C; = Tmin; Startup @ -25 °C 50 °C; = Tmax 	<ul style="list-style-type: none"> -40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C 60 °C; = Tmax -40 °C; = Tmin; Startup @ -25 °C 50 °C; = Tmax
Altitude during operation relating to sea level				
<ul style="list-style-type: none"> Installation altitude above sea level, max. Ambient air temperature-barometric pressure-altitude 	<ul style="list-style-type: none"> 5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m) 	<ul style="list-style-type: none"> 5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m) 	<ul style="list-style-type: none"> 5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m) 	<ul style="list-style-type: none"> 5 000 m Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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 in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
<ul style="list-style-type: none"> Resistant to commercially available coolants and lubricants 	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
<ul style="list-style-type: none"> to biologically active substances according to EN 60721-3-3 to chemically active substances according to EN 60721-3-3 to mechanically active substances according to EN 60721-3-3 	<ul style="list-style-type: none"> Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, * 	<ul style="list-style-type: none"> Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, * 	<ul style="list-style-type: none"> Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, * 	<ul style="list-style-type: none"> Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS analog inputs

Technical specifications (continued)

Article number	6AG1134-6HB00-2CA1	6AG1134-6HB00-2DA1	6AG1134-6JF00-2CA1	6AG1134-6JD00-2CA1
Based on	6ES7134-6HB00-0CA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	6ES7134-6HB00-0DA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	6ES7134-6JF00-0CA1 SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	6ES7134-6JD00-0CA1 SIPLUS ET 200SP AI 4xRTD/TC HF
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Technical specifications (continued)

Article number	6AG1134-6PA20-7BD0
Based on	6ES7134-6PA20-0BD0 SIPLUS ET 200SP AI EMETER 480VAC ST
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin; < -25 °C min. permissible supply voltage 110 V AC
• horizontal installation, max.	70 °C; = Tmax; > +60 °C max. permissible current 1 A per phase
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 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	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	6AG1134-6PA20-7BD0
Based on	6ES7134-6PA20-0BD0 SIPLUS ET 200SP AI EMETER 480VAC ST
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Electronic equipment on rolling stock acc. to EN 50155	Class PC2 protective coating acc. to EN 50155:2017
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Overview



- 2 and 4-channel analog output (AQ) modules

For different requirements, the digital output modules offer:

- Function classes Standard, High Feature and High-Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)

- Option for connecting current and voltage actuators
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - Oversampling operating mode (n-fold equidistant output of an analog value within one PN cycle and thus the precisely timed output of an analog value or a sequence of analog values)
 - Isochronous mode (simultaneous equidistant output of analog values)
 - Output of substitute value in the event of interruptions to communication (shutdown, output adjustable substitute value, or keep last value)
 - Calibration during runtime
 - Re-parameterization during operation
 - Firmware update
 - Diagnosis of wire break, short circuit, overflow, underflow
 - Value status (optional binary validity information of the analog signal in the process image)
 - Supports the PROFlenergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shielding terminal

A quick and clear comparison of the functions of the AQ modules is offered by the TIA Selection Tool.

Overview of analog output modules

Analog output	PU	Article No.	CC code	BU type
AQ 2 x I ST	1	6AG1135-6GB00-7BA1	CC00	A0, A1
AQ 4 x U/I ST	1	6AG1135-6HD00-7BA1	CC00	A0, A1
AQ 2 x U/I HF	1	6AG1135-6HB00-7CA1	CC00	A0, A1
AQ 2xU/I HS	1	6AG1135-6HB00-2DA1	CC00	A0, A1

With two operating modes:

- High-speed isochronous AQ
- Oversampling

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

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS analog outputs

Technical specifications

Article number	6AG1135-6HD00-7BA1	6AG1135-6GB00-7BA1	6AG1135-6HB00-2DA1	6AG1135-6HB00-7CA1
Based on	6ES7135-6HD00-0BA1 SIPLUS ET 200SP AQ 4xU/I ST	6ES7135-6GB00-0BA1 SIPLUS ET 200SP AQ 2xI STANDARD	6ES7135-6HB00-0DA1 SIPLUS ET 200SP AQ 2 X U/I HIGH SPEED	6ES7135-6HB00-0CA1 SIPLUS ET 200SP AQ 2xU/I HF
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; > +60 °C max. 2x ±10 V permissible	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin			-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax			60 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Technical specifications (continued)

Article number	6AG1135-6HD00-7BA1	6AG1135-6GB00-7BA1	6AG1135-6HB00-2DA1	6AG1135-6HB00-7CA1
Based on	6ES7135-6HD00-0BA1 SIPLUS ET 200SP AQ 4xU/I ST	6ES7135-6GB00-0BA1 SIPLUS ET 200SP AQ 2xI STANDARD	6ES7135-6HB00-0DA1 SIPLUS ET 200SP AQ 2 X U/I HIGH SPEED	6ES7135-6HB00-0CA1 SIPLUS ET 200SP AQ 2xU/I HF
Conformal coating				
<ul style="list-style-type: none"> Coatings for printed circuit board assemblies acc. to EN 61086 Protection against fouling acc. to EN 60664-3 Military testing according to MIL-I-46058C, Amendment 7 Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A 	Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

Ordering data

Ordering data	Article No.	Article No.
SIPLUS analog output modules (Extended temperature range and exposure to media)		Usable SIPLUS BaseUnits type A1 (temperature detection)
Analog output module AQ 2xI Standard, BU type A0 or A1, color code CC00, 16-bit	6AG1135-6GB00-7BA1	BU15-P16+A0+2D/T (Extended temperature range and exposure to media) BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)
Analog output module AQ 4xU/I Standard, BU type A0 or A1, color code CC03	6AG1135-6HD00-7BA1	BU15-P16+A0+2B/T (Extended temperature range and exposure to media) BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group
Analog output module AQ 2xU/I High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%	6AG1135-6HB00-7CA1	BU15-P16+A0+12D/T (Extended temperature range and exposure to media) BU type A1; BaseUnit (light) with 16 push-in terminals (1...16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)
Analog output module AQ 2xU/I High Speed, BU type A0 or A1, color code CC00, 16 bit, ± 0.3%	6AG1135-6HB00-2DA1	BU15-P16+A0+12B/T (Extended temperature range and exposure to media) BU type A1; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group
Usable SIPLUS BaseUnits type A0		Accessories See SIMATIC ET 200SP, analog output modules, page 9/69
BU15-P16+A0+2D (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA0	
BU15-P16+A0+2B (Extended temperature range and exposure to media) BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0	
BU15-P16+A10+2D (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 push-in 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 exposure to media) BU type A0; BaseUnit (dark) with 16 push-in 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	

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM Count 1x24V counter module

Overview



Technical properties

- Counter module for ET 200SP
- 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 reactions regardless of the counter status or measured value

- Counting frequency 200 kHz (800 kHz with quadruple evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

Supported types of encoders/signals

- 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
General information	
Product type designation	TM Count 1x24V
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V13 (FW V1.0), V14 (V1.2), V15 (FW V1.3) / V13 (FW V1.0), V14 SP1 (V1.2)
• STEP 7 configurable/integrated as of version	As of V5.5 SP3, only up to FW V1.2
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA
Digital inputs	
Number of digital inputs	3
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes

Article number	6ES7138-6AA00-0BA0 ET 200SP, TM Count 1x24V
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"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• 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 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, parameterizable	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 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total 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
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset 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	
• Source/sink input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	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
• Channel status display	Yes; Green 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
Counting frequency (counter) max.	800 kHz; with quadruple evaluation
Fast mode	Yes; FW V1.2 or higher
Counting functions	
• Can be used with TO High-Speed_Counter	Yes
• Continuous counting	Yes
• Counter response parameterizable	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

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC 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
Position detection	
• Incremental 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.	800 kHz
- Cycle duration measurement, min.	1.25 µs
- Cycle duration 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
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation

Article number	6ES7138-6AA00-0BA0 ET 200SP, TM Count 1x24V
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

Ordering data	Article No.	Accessories	Article No.
TM Count 1x24V counter module		Equipment labeling plate	
With one channel, max. 200 kHz; for 24 V encoder	6ES7138-6AA00-0BA0	10 sheets of 16 labels	6ES7193-6LF30-0AW0
Suitable BaseUnits		Labeling strips	
BU15-P16+A10+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 push-in 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	500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0
• 1 unit • 10 units		1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	6ES7193-6LA10-0AA0
BU15-P16+A0+2D		1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	BU cover	
• 1 unit • 10 units		For covering empty slots (gaps); 5 units	
2BU15-P16+A0+2DB		• 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6ES7193-6BP60-0DA0	Shield connection	6ES7193-6SC00-1AM0
• 1 unit		5 shield supports and 5 shield terminals	
BU15-P16+A10+2B		Color-coded labels	
BU type A0; BaseUnit (dark) with 16 push-in 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	• 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
• 1 unit • 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	6ES7193-6CP72-2AA0
BU15-P16+A0+2B		• 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
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0		
• 1 unit • 10 units			
2BU15-P16+A0+2B			
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	6ES7193-6BP60-0BA0		
• 1 unit			

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM PosInput 1 counter and position detection module

Overview



Technical properties

- Counter and position detection 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)
- Counting 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
General information	
Product type designation	TM PosInput 1
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V13 (FW V1.0), V14 (V1.2), V15 (FW V1.3) / V13 (FW V1.0), V14 SP1 (V1.2)
• STEP 7 configurable/integrated as of version	As of V5.5 SP3, only up to FW V1.2
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA
Digital inputs	
Number of digital inputs	2
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM Posinput 1
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
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• 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 technological functions	
- parameterizable	Yes

Technical specifications (continued)

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM Posinput 1	Article number	6ES7138-6BA00-0BA0 ET 200SP, TM Posinput 1
Cable length		Encoder signals, incremental encoder (asymmetrical)	
• shielded, max.	1 000 m	• Input voltage	5 V TTL (push-pull encoders only)
• unshielded, max.	600 m	• Input frequency, max.	1 MHz
Digital outputs		• Counting frequency, max.	4 MHz; with quadruple evaluation
Type of digital output	Transistor	• Signal filter, parameterizable	Yes
Number of digital outputs	2	• Incremental encoder with A/B tracks, 90° phase offset	Yes
Digital outputs, parameterizable	Yes	• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
Short-circuit protection	Yes; electronic/thermal	• Pulse encoder	Yes
Limitation of inductive shutdown voltage to	L+ (-33 V)	• Pulse encoder with direction	Yes
Controlling a digital input	Yes	• Pulse encoder with one impulse signal per count direction	Yes
Digital output functions, parameterizable		Encoder signals, absolute encoder (SSI)	
• Switching tripped by comparison values	Yes	• Input signal	to RS-422
• Freely usable digital output	Yes	• Telegram length, parameterizable	10 ... 40 bit
Switching capacity of the outputs		• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• with resistive load, max.	0.5 A; Per digital output	• Binary code	Yes
• on lamp load, max.	5 W	• Gray code	Yes
Load resistance range		• 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.
• lower limit	48 Ω	• Parity bit, parameterizable	Yes
• upper limit	12 kΩ	• Monoflop time	16, 32, 48, 64 μs & automatic
Output voltage		• Multiturn	Yes
• for signal "1", min.	23.2 V; L+ (-0.8 V)	• Singleturn	Yes
Output current		Interface types	
• for signal "1" rated value	0.5 A; Per digital output	• TTL 5 V	Yes; push-pull encoders only
• for signal "0" residual current, max.	0.5 mA	• RS 422	Yes
Output delay with resistive load		Isochronous mode	
• "0" to "1", max.	50 μs	Isochronous operation (application synchronized up to terminal)	Yes
• "1" to "0", max.	50 μs	Interrupts/diagnostics/status information	
Switching frequency		Substitute values connectable	Yes; Parameterizable
• with resistive load, max.	10 kHz	Alarms	
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve	• Diagnostic alarm	Yes
• on lamp load, max.	10 Hz	• Hardware interrupt	Yes
Total current of the outputs		Diagnostic messages	
• Current per module, max.	1 A	• Monitoring the supply voltage	Yes
Cable length		• Wire-break	Yes
• shielded, max.	1 000 m	• Short-circuit	Yes
• unshielded, max.	600 m	• A/B transition error at incremental encoder	Yes
Encoder signals, incremental encoder (symmetrical)		• Telegram error at SSI encoder	Yes
• Input voltage	RS 422	• Group error	Yes
• Input frequency, max.	1 MHz		
• Counting frequency, max.	4 MHz; with quadruple evaluation		
• Cable length, shielded, max.	32 m; at 1 MHz		
• Signal filter, parameterizable	Yes		
• Incremental encoder with A/B tracks, 90° phase offset	Yes		
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes		
• Pulse encoder	Yes		
• Pulse encoder with direction	Yes		
• Pulse encoder with one impulse signal per count direction	Yes		

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM PosInput 1 counter and position detection module

Technical specifications (continued)

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM Posinput 1
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green 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
Counting frequency (counter) max.	4 MHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	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
• 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
- Cycle duration measurement, min.	0.25 µs
- Cycle duration 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
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM Posinput 1
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

Ordering data	Article No.	Article No.
TM PosInput 1 counting and position detection module With one channel, max. 1 MHz for 5 V TTL or RS 422 differential signals or SSI absolute encoder	6ES7138-6BA00-0BA0	Accessories Equipment labeling plate 10 sheets of 16 labels
Suitable BaseUnits BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in 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) <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	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
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	BU cover For covering empty slots (gaps); 5 units <ul style="list-style-type: none"> • 15 mm wide • 20 mm wide
2BU15-P16+A0+2DB Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) <ul style="list-style-type: none"> • 1 unit 	6ES7193-6BP60-0DA0	Shield connection 5 shield supports and 5 shield terminals
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0	Color-coded labels <ul style="list-style-type: none"> • 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
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in 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	6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0
2BU15-P16+A0+2B Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group <ul style="list-style-type: none"> • 1 unit 	6ES7193-6BP60-0BA0	

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM Timer DIDQ 10x24V time-based IO module

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
General information	
Product type designation	TM Timer DIDQ 10x24V
Product function	
• I&M data	Yes; I&M 0
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V13 Update 3
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
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
Digital inputs	
Number of digital inputs	4
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
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

Article number	6ES7138-6CG00-0BA0 ET 200SP, TM Timer DIDQ 10x24V
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• 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
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	6
Current-sinking	Yes; With High Speed output
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V

Technical specifications (continued)

Article number	6ES7138-6CG00-0BA0 ET 200SP, TM Timer DIDQ 10x24V
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
Total 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
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° phase offset	Yes
• Pulse encoder	Yes

Article number	6ES7138-6CG00-0BA0 ET 200SP, TM Timer DIDQ 10x24V
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	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• 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
Counting frequency (counter) max.	200 kHz; with quadruple evaluation
Counting functions	
• Continuous counting	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Decentralized operation	
to SIMATIC S7-1500	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM Timer DIDQ 10x24V time-based IO module

Ordering data**Article No.****TM Timer DIDQ 10x24V time-based IO module**

4 time-controlled inputs,
6 time-controlled outputs

6ES7138-6CG00-0BA0**Suitable BaseUnits****BU15-P16+A10+2D**

BU type A0; BaseUnit (light) with 16 push-in 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+A0+2D**

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

- 1 unit
- 10 units

6ES7193-6BP00-0DA0
6ES7193-6BP00-2DA0**2BU15-P16+A0+2DB**

Double BaseUnit for holding 2 I/O modules;
BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)

- 1 unit

6ES7193-6BP60-0DA0**BU15-P16+A10+2B**

BU type A0; BaseUnit (dark) with 16 push-in 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**BU15-P16+A0+2B**

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

- 1 unit
- 10 units

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0**2BU15-P16+A0+2B**

Double BaseUnit for holding 2 I/O modules;
BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group

- 1 unit

6ES7193-6BP60-0BA0**Article No.****Accessories****Equipment labeling plate**

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



2-channel pulse output module for ET 200SP

- Operating modes:
 - Single pulse with defined length
 - Pulse chain with defined number of pulses
 - Pulse width modulation (with flexible ON period, optional current control and dither function)
 - PWM signal for controlling a DC motor
 - ON and OFF delay; rising and falling edge can be delayed separately to the microsecond
 - Frequency output with defined output frequency
- Hardware:
 - 2 channels 24 V, 2 A output current
 - Parallel switching for enhanced performance on 4 A output current
 - Switching frequencies to 10 kHz; at reduced output current to 0.1 A up to 100 kHz
 - Push-pull output driver for especially steep edges at the outputs
 - Polarity change in DC motor operation for direction reversal
 - 1 high-speed 24 V digital input per channel with parameterizable input delay from 4 μ s
- Channel functions:
 - HW enable; start of signal output with the onboard digital input
 - Parameterizable ON delay; for precise deceleration between the HW enable and the start of output
 - Current measurement in the operating modes pulse-width modulation and pulse chain; enables control of the output current mean value over a period. This allows you to compensate for the effect of temperature on the actuator resistance.
 - Cyclic control of the respective main setpoint from the PLC in every operating mode; other values can be modified flexibly from the user program.
- Supported system functions:
 - Isochronous mode; enables precision-timed connection of the setpoint output to a higher-level controller
 - Firmware update
 - Identification data I&M

Technical specifications

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
General information	
Product type designation	TM Pulse 2x24 V
Product function	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V13 SP1 + HSP
• STEP 7 configurable/integrated as of version	V5.5 SP4 and higher
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.31
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
Encoder supply	
Number of outputs	2; A common 24V encoder supply for both channels
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; per module, electronic
• Output current, max.	300 mA

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
Digital inputs	
Number of digital inputs	2; 1 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Freely usable digital input	Yes
• HW enable for digital output	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• 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.	4 μ s; for parameterization "none"
- at "1" to "0", min.	4 μ s; for parameterization "none"

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM Pulse 2x24V pulse output module

Technical specifications (continued)

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
Digital outputs	
Type of digital output	P- and M-switching
Number of digital outputs	2; 1 per channel
Current-sinking	Yes
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Freely usable digital output	Yes
• PWM output	Yes
- Number, max.	2; 1 per channel
- Cycle duration, parameterizable	Yes; Max. 85 s
• Connection of a proportional valve	Yes
• Dithering	Yes
• Current measurement	Yes
• Current control	Yes
• Connection of a DC motor	Yes
• ON-delay	Yes
• OFF-delay	Yes
• Frequency output	Yes
• Pulse train	Yes
• Pulse output	Yes
Switching capacity of the outputs	
• with resistive load, max.	2 A
• on lamp load, max.	10 W; 1 W with High Speed output
Load resistance range	
• lower limit	12 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	2 A; 0.1 A with High Speed output, observe derating
Output delay with resistive load	
• "0" to "1", typ.	0 μs; With High Speed output, 4.5 μs with Standard output
• "0" to "1", max.	0.8 μs; With High Speed output, 9 μs with Standard output
• "1" to "0", typ.	0 μs; With High Speed output, 4.5 μs with Standard output
• "1" to "0", max.	0.8 μs; With High Speed output, 9 μs with Standard output
Parallel switching of two outputs	
• for uprating	Yes

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
Switching frequency	
• with resistive load, max.	100 kHz; With High Speed output, 10 kHz with standard output
• with inductive load, max.	100 kHz; With High Speed output, 10 kHz with standard output
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	2 A
• Current per group, max.	4 A
• Current per module, max.	4 A
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Bus cycle time (TDP), min.	250 μs; with 1 channel configuration, 375 μs with 2 channel configuration
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• 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
Potential separation	
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	50 g

Ordering data	Article No.	Accessories	Article No.
Pulse output module TM Pulse 2x24V PWM and pulse output, 2 channels of 2 A for proportional valves and DC motors	6ES7138-6DB00-0BB1	Equipment labeling plate 10 sheets of 16 labels	6ES7193-6LF30-0AW0
Usable BaseUnits BU20-P12+A0+4B BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group	6ES7193-6BP20-0BB1	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	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0
		BU cover for covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM StepDrive 24...48V/5A stepper motor control (Phytron Co.)

Overview



The TM StepDrive module from Phytron is a high-precision stepper motor control with integrated power output stage for use in the SIMATIC ET 200SP distributed I/O system. It is the 1-step-drive successor model for the SIMATIC ET 200S.

The module can be used together with system and I/O components of the ET 200SP distributed I/O system. Operation is possible with the following head modules:

- IM PROFIBUS
- IM PROFINET
- ET 200SP CPU

Corresponding GSD files and an HSP are available.

The ET 200SP TM StepDrive 24...48V/5A is a product of our Phytron GmbH product partner and is only available from the Phytron GmbH company.

Note:

Product partners are external companies outside Siemens AG and its associated companies. Information about and descriptions of products made by product partners are non-binding, and are the responsibility of the product partners. These products are manufactured independently and under the responsibility of the respective product partner, and are sold and supplied by it under its terms of business and delivery.

Unless compulsory by law, Siemens assumes no liability or warranty for these products or for connection with these products of the product partners. Please refer also to the note on exemption from liability/use of hyperlinks.

Application

High-precision control of stepper motors:

The technology of the StepDrive TM enables precise current settings which facilitate fine positioning down to 1/256 step with an absolute error of only $\sim 0.003^\circ$. This corresponds to approx. 51 200 positions per revolution or $0.007^\circ/\text{step}$ with a 200-step motor.

The module permits connection of a 2-phase stepper motor in the 350 W power range up to 5 A peak with a supply voltage 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 for modification.

The TM StepDrive features the following positioning functions:

- Absolute positioning
- Relative positioning
- Reference point approach
- Endless axes: Speed mode/frequency output
- Selection of feedback value

Particularly noteworthy is the use of TM StepDrive together with the TO Motion Control.

A list of possible BaseUnits with which the TM StepDrive can be operated can be found in the manufacturer's manual.

Technical specifications

- Suitable for bipolar control of 2-phase stepper motors of 4-, (6-) or 8-wire design (in 4-wire system)
- 5 A peak phase current with adjustable current steps
- Supply voltage from 24 to 48 V DC
- Up to 1/256 microstep (physical resolution: approx. 51 200 positions per revolution ($0.007^\circ/\text{step}$)).
- Maximum stepping rate: 250 000 steps/s
- 2 digital inputs for limit and reference switches
- Diagnostics LEDs (overcurrent, overtemperature, traversing task or motor running ...)
- Short-circuit-proof, overload-proof
- Data record transfer for power output stage parameter assignment and diagnostics during runtime
- Overdrive: Current adaptation for higher clock frequencies
- Booster: Enhanced torque during acceleration or braking
- Adjustable response to CPU stop

Ordering data

TM StepDrive stepper motor control

Further information and ordering options via Phytron (company):
<http://www.phytron.com/tm-stepdrive>

High-precision stepper motor control for ET 200SP

Suitable BaseUnits

BU20-P12+A0+4B

BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group

6ES7193-6BP20-0BB1

More information

You can find more information about the module as well as contact information at:

<http://www.phytron.com/tm-stepdrive>

Here 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.

Service and support:

<http://www.phytron.com/support>

Overview



SIPLUS and SIMATIC Electrical Charge Controller are the key components in infrastructure solutions for the conductive charging of electric vehicles.

They perform the following functions:

- Detection of the charging cable and its permissible current carrying capacity
- Transfer of the maximum charging current from the charging station to the electric vehicle
- Evaluation of the status signals from the electric vehicle:
 - Ready for charging
 - Charging
 - Charging with ventilation
- Cost-optimized, space-saving charging infrastructure solutions due to compact design based on SIMATIC ET 200SP

AC module ET 200SP TM ECC 2xPWM ST

- Control of charging outputs according to IEC 61851 by parameterizable SIMATIC ET 200SP TM ECC 2xPWM ST charging controller
- Control of load tap-off
- Control of connector lock
- Evaluation of connector lock or load contactor status

DC module ET 200SP TM ECC PL ST

- Complete control of a DC charging process according to DIN 70121 by SIMATIC ET 200SP TM ECC PL ST charging controller.
- The following sequences are executed:
 - Session setup enter
 - Service discovery
 - Service and payment selection
 - Cable check
 - Charge parameter discovery
 - Contract authentication
 - PreCharge
 - Power delivery
 - Welding detection
 - Current demand
 - Session setup exit

Technical specifications

Article number	6FE1242-6TM10-0BB1 SIMATIC ET 200SP TM ECC 2xPWM ST	6FE1242-6TM20-0BB1 SIMATIC ET 200SP TM ECC PL ST
General information		
Product brand name	SIMATIC	SIMATIC
Product designation	ET 200SP, TM ECC 2xPWM ST	ET 200SP, TM ECC PL ST
Product description		Technology module for the conductive charging of electric vehicles according to DIN 70121
usable BaseUnits	BU type B0, B1	BU type B0, B1
Number of channels	2; Acc. to IEC 61851-1 Mode 3 and/or SAE J1772	1; Acc. to IEC 61851-1 Mode 4 and DIN SPEC 70121
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No
Engineering with		
• STEP 7 TIA Portal configurable/ integrated as of version	V14 SP1	V15
Installation type/mounting		
Mounting type	standard rail	standard rail
Mounting position	Horizontal	Horizontal, vertical
Supply voltage		
Type of supply voltage	DC	
Rated value (DC)	24 V	24 V
permissible range, lower limit (DC)	19.2 V	19.2 V
permissible range, upper limit (DC)	28.8 V	28.8 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIMATIC ET 200SP ECC charging controllers

Technical specifications (continued)

Article number	6FE1242-6TM10-0BB1 SIMATIC ET 200SP TM ECC 2xPWM ST	6FE1242-6TM20-0BB1 SIMATIC ET 200SP TM ECC PL ST
Load voltage L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection		Yes
Input current		
Current consumption, typ.	40 mA	40 mA
Current consumption, max.	90 mA	100 mA
Digital inputs		
Number of digital inputs	2; 1 per channel	0
Digital inputs, parameterizable	Yes; 12 V / 24 V	No
Digital input functions, parameterizable		
• Freely usable digital input	No; Readback contact contactor / connector lock	
Input voltage		
• Type of input voltage	DC	
• for signal "0"	<0.2 V (nom)	
• for signal "1"	>0.6 V (nom)	
• permissible voltage at input, min.	0 V	
• permissible voltage at input, max.	30 V	
for technological functions		
- parameterizable	Yes	Yes
Cable length		
• shielded, max.		10 m
• unshielded, max.	30 m	
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	2; 1 per channel	2; 1x digital out TRIP function as open collector, 1x digital out (DQ P) as open collector
Current-sinking		Yes
short-circuit proof	Yes	Yes
Short-circuit protection	Yes; electronic/thermal	
Digital output functions, parameterizable		
• PWM output	Yes; According to IEC 61851	Yes; Acc. to DIN SPEC 70121
- Number, max.	2; 1 per channel	1; 1 per channel
• Connection of a DC motor	Yes; ACT p/n connector locking	No; Only fixed charging cables are permitted for DC charging systems
Switching capacity of the outputs		
• with resistive load, max.	1.3 A	0.6 A; Per digital output
Output voltage		
• Type of output voltage	DC	DC
• Output voltage, min.	24 V	24 V
Cable length		
• unshielded, max.	30 m	10 m
Analog outputs		
Number of analog outputs	2	1
Type of analog output	Control pilot acc. to IEC 61851-1 and/or SAE J1772	Control pilot including Powerline Green Phy, acc. to DIN SPEC 70121
Connection of a DC motor	Yes	No
Protocols		
Bus communication	Yes	Yes; Backplane bus
Vehicle communication according to IEC 61851	Yes; MODE 3	Yes; Mode 4

Technical specifications (continued)

Article number	6FE1242-6TM10-0BB1 SIMATIC ET 200SP TM ECC 2xPWM ST	6FE1242-6TM20-0BB1 SIMATIC ET 200SP TM ECC PL ST
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Monitoring the supply voltage	No	No; Supply voltage diagnostics
• Wire-break		No
• Short-circuit	Yes	No
Diagnostics indication LED		
• ERROR LED	Yes; Red LED	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation		
Potential separation channels		
• between the channels	No	No; Only one channel is available
• between the channels and backplane bus	Yes	Yes
Isolation		
Isolation tested with	707 V DC	707 V DC
Degree of pollution	2	2
EMC		
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge	4 kV contact discharge / 8 kV air discharge
Field-related interference acc. 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)	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV signal lines	2 kV signal lines
Conducted interference due to surge acc. to IEC 61000-4-5	On DC supply lines: 0.5 kV symmetrical and asymmetrical	On DC supply lines: 0.5 kV symmetrical and asymmetrical
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)	10 V (0.15 ... 80 MHz)
Degree and class of protection		
IP degree of protection	IP20	IP20
Standards, approvals, certificates		
Certificate of suitability	CE / RCM / EAC / UL	CE / RCM / EAC / UL
Ambient conditions		
Ambient temperature during operation		
• min.	-30 °C	-30 °C
• max.	60 °C	60 °C
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C
Ambient temperature during storage/transportation		
• Storage, min.	-40 °C	-40 °C
• Storage, max.	70 °C	70 °C
• Transportation, min.	-40 °C	-40 °C
• Transportation, max.	70 °C	70 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.		2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIMATIC ET 200SP ECC charging controllers

Technical specifications (continued)

Article number	6FE1242-6TM10-0BB1 SIMATIC ET 200SP TM ECC 2xPWM ST	6FE1242-6TM20-0BB1 SIMATIC ET 200SP TM ECC PL ST
Relative humidity		
• Operation, min.	5 %	5 %
• Operation, max.	95 %; no condensation	95 %; no condensation
Vibrations		
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g
Shock testing		
• Shock resistance acc. to IEC 60068-2-27	15 g / 11 ms	15 g / 11 ms
Decentralized operation		
to SIMATIC S7-1500	Yes	Yes
Dimensions		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	32 g	51 g

Ordering data

Charging controller SIMATIC ET200SP TM ECC 2xPWM S

Designed for controlling charging outputs according to IEC 61851 and parameterizable, with 2 charging outputs, ambient temperature -30°C...60°C, 2x control pilot, 2x plug present, 2x DQ switching contact for load contactor as open collector, 2x DI for load contactor feedback or connector lock;

Article No.

6FE1242-6TM10-0BB1

Charging controller SIMATIC ET200SP TM ECC PL ST

Charging controller for conductive charging of electric vehicles according to DIN SPEC 70121, charging mode 4, ambient temperature -30 °C ... 60 °C, 1x control pilot including Powerline Green Phy, 1x Plug Present /Proximity Pilo, 1x Digital Out TRIP function as open collector, 1x Digital Out (DQ P) as open collector, suitable for BU type BU20-P12+A0+4B or BU type BU20-P12+A4+0B

Article No.

6FE1242-6TM20-0BB1

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, diagnostic system and configuration tools in the TIA Portal, SIMATIC STEP 7, WinCC flexible and PCS7.

Technical specifications

SIWAREX WP321	
Integration in automation systems	<p>SIMATIC S7-300, S7-400, S7-1200 and S7-1500</p> <p>Other manufacturers (with restrictions)</p>
Communication interfaces	<ul style="list-style-type: none"> • SIMATIC ET 200SP backplane bus • RS 485 (SIWATOOL, Siebert remote display)
Commissioning options	<ul style="list-style-type: none"> • Using SIWATOOL V7 • Using function block in SIMATIC CPU / Touch Panel
Measuring accuracy	<p>according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)</p> <p>Internal resolution</p> <p>Measuring frequency</p>
Digital filter	Variable adjustable low-pass and average filter
Typical applications	<ul style="list-style-type: none"> • Non-automatic weighing instruments • Force measurements • Fill-level monitoring • Belt tension monitors
Weighing functions	
Weight values	<ul style="list-style-type: none"> • Gross • Net • Tare
Limit values	<ul style="list-style-type: none"> • 2 x min/max • Empty
Zeroing	Via command by controller or HMI
Tare	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	Full-bridge strain gauges in 4-wire or 6-wire system

SIWAREX WP321	
Load cell powering	<p>Supply voltage (value applies at sensor, cable-related voltage drops of up to 5 V are controlled)</p> <p>Permissible load resistance</p> <ul style="list-style-type: none"> • R_{Lmin} • R_{Lmax} <p>With SIWAREX IS Ex interface</p> <ul style="list-style-type: none"> • R_{Lmin} • R_{Lmax}
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/certificates	<ul style="list-style-type: none"> • ATEX Zone 2 • UL • FM • EAC • KCC • IECEx • RCM
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 EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min(IND)} \dots T_{max(IND)}$ (operating temperature)	
• Vertical installation in SIMATIC S7 ¹⁾	-25 ... +50 °C (-13 ... 122 °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 (32 °F). For operating conditions below 0 °C (32 °F), SIMATIC modules from the SIPLUS series must be used.

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIWAREX WP321

Ordering data	Article No.	Article No.
TM SIWAREX WP321 weighing module Single-channel, for platform or hopper scales with analog load cells (1–4 mV/V), 1 x LC, 1 x RS 485.	7MH4138-6AA00-0BA0	
SIWAREX WP321 manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing-technology		7MH4710-5BA 7MH4710-5CA
SIWAREX WP321 "Ready for Use" TIA Portal and SIMATIC Manager sample configuration Free download on the Internet at: http://www.siemens.com/weighing-technology		
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	7MH4900-1AK01	
SIWAREX PCS7 AddOn Library for PCS7 V8.x and V9.0 <ul style="list-style-type: none"> Supports PROFINET APL faceplates and function blocks for: <ul style="list-style-type: none"> SIWAREX U SIWAREX FTA SIWAREX FTC_B (conveyor scales) SIWAREX WP321 Classic faceplate and function block for: <ul style="list-style-type: none"> SIWAREX FTC_L (loss in weight) 	7MH4900-1AK61	7MH4702-8AG 7MH4702-8AF
Accessories (mandatory requirement)		
BaseUnit (Type A0 – one BaseUnit required for each WP321) <ul style="list-style-type: none"> For opening a new potential group <ul style="list-style-type: none"> BU15P-16+A0+2D or BU15P-16+A10+2D For continuing the potential group <ul style="list-style-type: none"> BU15P-16+A0+2B BU15P-16+A10+2B 	6ES7193-6BP00-0DA0 6ES7193-6BP20-0DA0 6ES7193-6BP00-0BA0 6ES7193-6BP20-0BA0	
Shielded connection for BaseUnit (5 units / for 5 scales) For laying the load cell cable	6ES7193-6SC00-1AM0	
Accessories (optional)		
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	7MH5001-0AA20	
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel.	7MH5001-0AA00	
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	
SIWAREX IS Ex interface For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing system. Compatibility of load cells must be checked separately. Approved for use in the EU <ul style="list-style-type: none"> Short-circuit current < 199 mA DC 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 For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 in) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F). Sold by the meter. <ul style="list-style-type: none"> Sheath color: orange For hazardous atmospheres. Sheath color: blue. 		
RS 485/USB interface converter Commercially available interface converter with FTDI chip, e.g. USB-Nano from CTI https://www.cti-shop.com/en/rs485-converter/usb-nano-485		
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 Postfach 1180D-65565 Eppelborn, Germany Tel.: +49 6806/980-9 Fax: +49 6806/980-999 Internet: http://www.siebert.de Detailed information is available from the manufacturer.		
Commissioning		
Commissioning charge for one static scale with SIWAREX module (Travel and setup charge must be ordered separately) Scope: <ul style="list-style-type: none"> Recording of data Checking of mechanical installation of the scale Checking of electrical wiring and function Static adjustment of the scale Requirements: <ul style="list-style-type: none"> Mechanical design functional Modules electrically wired and tested Calibration weights available Free access to scale 		9LA1110-8SN50-0AA0
Flat charge for travel and setup in Germany		9LA1110-8RA10-0AA0

Overview



Technical properties

- Counter module for ET 200SP
- 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 reactions regardless of the counter status or measured value
- Counting frequency 200 kHz (800 kHz with quadruple evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

Supported types of encoders/signals

- 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

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	6AG1138-6AA00-2BA0
Based on	6ES7138-6AA00-0BA0 SIPLUS ET 200SP TM COUNT 1X24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Count 1x24V counter module

Ordering data

SIPLUS TM Count 1x24V counter module (Extended temperature range and medial exposure) With one channel, max. 200 kHz; for 24 V encoder	6AG1138-6AA00-2BA0
Usable BaseUnits (Extended temperature range and medial exposure)	
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA0
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in 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 BU type A0; BaseUnit (dark) with 16 push-in 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

Further accessories	See SIMATIC TM Count 1x24V counter module, page 9/91
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Overview



Technical properties

- Counting and position detection 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)
- Counting 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

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	6AG1138-6BA00-2BA0
Based on	6ES7138-6BA00-0BA0 SIPLUS ET 200SP TM POSINPUT 1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; see Derating BasedOn (e.g. manual)
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; see Derating BasedOn (e.g. manual)
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O SystemsSIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM PosInput 1 counting and position detection module

Ordering data	Article No.	Other accessories	Article No.
SIPLUS TM PosInput 1 counting and position detection module (Extended temperature range and exposure to environmental substances) With one channel, max. 1 MHz for 5 V TTL or RS 422 differential signals or SSI absolute encoder	6AG1138-6BA00-2BA0	See TM PosInput 1 counting and position detection module, page 9/95	
Usable BaseUnits (Extended temperature range and exposure to environmental substances)			
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA0		
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0		
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in 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 BU type A0; BaseUnit (dark) with 16 push-in 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		

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

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	6AG1138-6CG00-2BA0
Based on	6ES7138-6CG00-0BA0 SIPLUS ET 200SP TM TIMER DIDQ 10x24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; see Derating BasedOn (e.g. manual)
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; see Derating BasedOn (e.g. manual)
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O Systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > Time-based IO module SIPLUS TM timer DIDQ 10x24V

Ordering data**Article No.****Time-based IO module
SIPLUS TM timer DIDQ 10x24 V**(Extended temperature range
and exposure to environmental
substances)4 time-controlled inputs,
6 time-controlled outputs**6AG1138-6CG00-2BA0****Usable BaseUnits**(Extended temperature range
and exposure to environmental
substances)**BU15-P16+A0+2D****6AG1193-6BP00-7DA0**BU type A0; BaseUnit (light) with
16 push-in terminals to the module;
for starting a new load group
(max. 10 A)**BU15-P16+A0+2B****6AG1193-6BP00-7BA0**BU type A0; BaseUnit (dark) with
16 push-in terminals to the module;
for continuing the load group**BU15-P16+A10+2D****6AG1193-6BP20-7DA0**BU type A0; BaseUnit (light)
with 16 push-in 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****6AG1193-6BP20-7BA0**BU type A0; BaseUnit (dark)
with 16 push-in terminals (1...16) to
the module and an additional
10 internally jumpered
AUX terminals (1 A to 10 A);
for continuing the load group**Other accessories****Article No.**See SIMATIC TM Timer
DIDQ 10x24V time-based
IO module, page 9/98

Overview



2-channel pulse output module for SIPLUS ET 200SP

- Operating modes:
 - Single pulse with defined length
 - Pulse chain with defined number of pulses
 - Pulse width modulation (with flexible ON period, optional current control and dither function)
 - PWM signal for controlling a DC motor
 - On and OFF delay; rising and falling edge can be delayed separately to the microsecond
 - Frequency output with defined output frequency

- Hardware:
 - 2 24V channels, 2A output current can be switched in parallel to boost performance to 4 A of output current
 - Switching frequencies to 10 kHz; at reduced output current to 0.1 A up to 100 kHz
 - Push/pull output driver for especially steep edges at the outputs
 - Polarity change in DC motor operation for direction reversal
 - 1 high-speed 24 V digital input per channel with parameterizable input delay from 4 μ s
- Channel functions:
 - HW enable; Start of signal output with the onboard digital input
 - Parameterizable ON delay; for precise deceleration between the HW enable and the start of output
 - Current measurement in the operating modes pulse-width modulation and pulse chain; enables control of the output current mean value over a period. Temperature influences can thus be balanced to the resistance of the actuator.
 - Cyclic control of the respective main setpoint from the PLC in every operating mode; other values can be modified flexibly from the user program.
- Supported system functions:
 - Isochronous mode; enables precision-timed connection of the setpoint output to a higher-level controller
 - Firmware update
 - Identification data I&M

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	6AG1138-6DB00-2BB1
Based on	6ES7138-6DB00-0BB1 SIPLUS ET 200SP TM PULSE 2x24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	50 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

Article number	6AG1138-6DB00-2BB1
Based on	6ES7138-6DB00-0BB1 SIPLUS ET 200SP TM PULSE 2x24V
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Pulse 2x24V pulse output module

Technical specifications (continued)

Article number	6AG1138-6DB00-2BB1	Article number	6AG1138-6DB00-2BB1
Based on	6ES7138-6DB00-0BB1 SIPLUS ET 200SP TM PULSE 2x24V	Based on	6ES7138-6DB00-0BB1 SIPLUS ET 200SP TM PULSE 2x24V
Use on ships/at sea		Conformal coating	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
Remark		• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!		

Ordering data

SIPLUS TM Pulse 2x24V pulse output module
(Extended temperature range and medial exposure)
PWM and pulse output, 2 channels of 2 A for proportional valves and DC motors

Article No.

6AG1138-6DB00-2BB1

Usable BaseUnits

(Extended temperature range and medial exposure)

BU20-P12+A0+4B

BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group

6AG1193-6BP20-7BB1

Article No.

Further accessories

See SIMATIC TM Pulse 2x24V pulse output module, page 9/101

Overview



- CM PtP communication module; module for serial communication connections with RS 232 and RS 422 interfaces. RS 485 for the Freepoint, 3964(R), Modbus RTU and USS protocols, max. 115.2 kbps, 2 KB frame length, 4 KB receive buffer

- Protocols supported
 - Freepoint: 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 bps
- 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 No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- Optional system-integrated shield connection

Technical specifications

Article number	6ES7137-6AA00-0BA0 ET 200SP, CM PTP
General information	
Product type designation	CM PtP
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V12 / V12
• STEP 7 configurable/integrated as of version	V5.5 SP2 with GSD file
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface types	
• RS 485	Yes
• RS 422	Yes
• RS 232	Yes
RS 232	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	15 m
• RS 232 auxiliary signals	RTS, CTS, DTR, DSR, RI, DCD
RS 485	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 200 m

Article number	6ES7137-6AA00-0BA0 ET 200SP, CM PTP
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
Integrated protocols	
Freepoint	
- 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
Telegram buffer	
• Buffer memory for telegrams	4 kbyte
• Number of telegrams which can be buffered	255

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM PtP serial interface

Technical specifications (continued)

Article number	6ES7137-6AA00-0BA0 ET 200SP, CM PTP
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostic messages	
• 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
• Transmit TxD	Yes; Green LED
Potential separation	
between backplane bus and interface	Yes

Article number	6ES7137-6AA00-0BA0 ET 200SP, CM PTP
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; From FS03
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; From FS03
• vertical installation, max.	50 °C
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 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+A10+2D	
BU type A0; BaseUnit (light) with 16 push-in 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+A0+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	6ES7193-6BP00-0DA0
• 10 units	6ES7193-6BP00-2DA0
2BU15-P16+A0+2DB	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	6ES7193-6BP60-0DA0

Article No.

BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 push-in 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
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	6ES7193-6BP00-0BA0
• 10 units	6ES7193-6BP00-2BA0
2BU15-P16+A0+2B	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	6ES7193-6BP60-0BA0
Equipment labeling plate	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	

Overview



- CM 4x 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
- Time-based IO
Time-based IO ensures that signals are output with a precisely defined response time. By combining inputs and outputs, for example, passing products can be accurately measured or fluids dosed in precise quantities
- Supported data transfer rates
 - COM1 (4.8 kbps)
 - COM2 (38.4 kbps)
 - COM3 (230.4 kbps)

- Expansion limits
 - Length of cable: Max. 20 m
 - Max. 32 bytes of input and output data per port
 - Max. 144 bytes of input data and 128 bytes of 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 on the e-coding element
 - Re-parameterization during operation
 - Identification data I&M
 - Firmware update
 - PROFlenergy
- Can be plugged into Type A0 BaseUnits (BU) with automatic e-coding
- LEDs
 - 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 CM module class: silver
 - Hardware and firmware version
 - Complete Article No.
- Optional accessories
 - Labeling strips
 - Equipment labeling plate
 - Color-coding plate with color code CC04
- Optional system-integrated shield connection

Overview of CM 4 x IO-Link

Communication module	Article No.	CC Code	BU type	PU
CM 4 x IO-Link	6ES7137-6BD00-0BA0	CC04	A0	1

Overview of BaseUnits

BaseUnit	Article No.	CC Codes for push-in terminals	CC Codes for AUX terminals	PU
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM 4 x IO-Link

Overview (continued)

BaseUnit	Article No.	CC Codes for push-in terminals	CC Codes for AUX terminals	PU
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
BU type A0 • Forwarding of load group (dark) • 16 push-in 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
General information	
Product type designation	CM 4 x IO-Link ST, PU 1
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	STEP 7 V15 or higher
• STEP 7 configurable/integrated as of version	STEP 7 V5.5 or higher
• PROFIBUS as of GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/GSD revision	GSDML V2.3
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	4
Output current	
• Rated value	200 mA; Per channel
24 V encoder supply	
• Short-circuit protection	Yes
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), 230.4 kBaud (COM3)
Cycle time, min.	2 ms; dynamic, depending on user data length
Size of process data, input per port	32 byte; max.
Size of process data, input per module	144 byte; max.
Size of process data, output per port	32 byte; max.
Size of process data, output per module	128 byte; max.
Memory size for device parameter	2 kbyte; for each port
Master backup	Yes
Configuration without S7-PCT	Yes
Cable length unshielded, max.	20 m

Article number	6ES7137-6BD00-0BA0 ET 200SP, CM 4 X IO-Link ST
Operating modes	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA per channel
Time Based IO	
- TIO IO-Link IN	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
- TIO IO-Link OUT	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
- TIO IO-Link IN/OUT	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
Connection of IO-Link devices	
• Port type A	Yes
• Port type B	Yes; 24 V DC via external terminal
• via three-wire connection	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes; The port diagnosis is available in the IO-Link mode only.
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	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

Technical specifications (continued)

Article number	6ES7137-6BD00-0BA0 ET 200SP, CM 4 X IO-Link ST
Potential separation	
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No

Article number	6ES7137-6BD00-0BA0 ET 200SP, CM 4 X IO-Link ST
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

Ordering data

Ordering data	Article No.
CM 4x 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
Accessories	
Usable type A0 BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in 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+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) • 1 unit • 10 units	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0
2BU15-P16+A0+2DB Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) • 1 unit	6ES7193-6BP60-0DA0
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in 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
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group • 1 unit • 10 units	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0

Ordering data	Article No.
2BU15-P16+A0+2B Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group • 1 unit	6ES7193-6BP60-0BA0
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	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, perforated, for inscription with laser printer	6ES7193-6LA10-0AA0
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AG0
Color-coded labels	
Color code CC04, for 16 push-in 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
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
Spare parts	
Electronic coding element type H Pack of 5 units; included in scope of supply of CM 4x IO-Link module	6ES7193-6EH00-1AA0

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM AS-i Master ST for SIMATIC ET 200SP

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 and higher, or via GSD in other systems
- Supply via AS-Interface cable
- Suitable for AS-Interface with 30-V voltage and AS-i Power24V
- Integrated ground-fault monitoring for the AS-Interface cable
- Through connection to AS-Interface, the number of digital inputs and outputs available for the control system is greatly increased (max. 496 DI/496 DQ on the AS-Interface per CM AS-i Master ST)
- Integrated analog value processing

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.

More information,
see [SIMATIC ET 200 SP Manual Collection](#).

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 communication 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 No. and serial number)
- Connection diagram
- Color coding of the CM module type: light gray
- Hardware and firmware version
- Complete Article No.

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 setups and tool changing with integrated input/output modules during ongoing operation. Without deactivating the controller, AS-i input/output modules can be added in the system.

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 via automatic alarm indications, via the process image or data record reading in the user program or in the STEP 7 engineering system in a graphical overview matrix. The AS-i network's transmission quality can also be read out. To avoid configuration errors, duplicate addresses in the AS-i network can be detected.

The new functions are available with 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 840D sl or other controller.

In the network view, the AS-i slaves' online diagnostics status can be displayed directly on the slaves (for S7-1500 CPUs with firmware version V2.0 or higher, with TIA Portal STEP 7 V14 or higher).

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

Overview (continued)

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions only represent one component of such a concept.

For more information on Industrial Security, see <http://www.siemens.com/industrialsecurity>.

Configuration

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

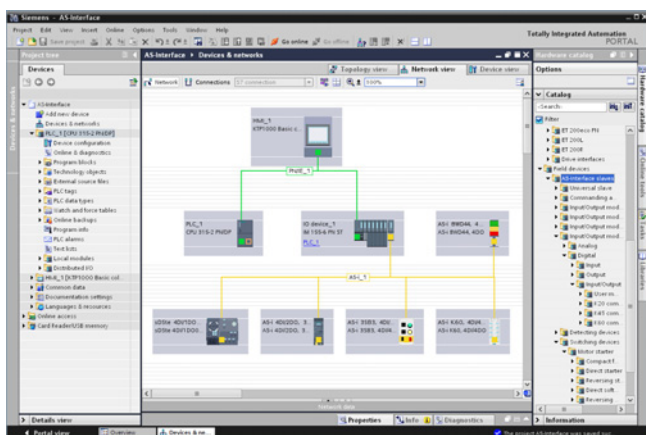
- STEP 7 (TIA Portal) V12 or higher or V13 SP1 or higher (for firmware V1.1) or
- STEP 7 (classic) V5.5 SP3 HF4 or higher with HSP 2092 or HSP 2092 V3.0 (for firmware V1.1) or
- the GSD file of the ET 200SP with STEP 7 or another engineering tool

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.

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.

Together with an ET 200SP CPU 1510SP / 1512SP (firmware V1.8 or higher) or 1515SP PC, preprocessing of safe AS-i signals directly in the ET 200SP station and setting up of an independent AS-i station without a higher-level CPU are possible (TIA Portal V13 SP1 Update 4 and higher).



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

Benefits

The CM AS-i Master ST communication module for ET 200SP enables modular, simple and high-performance expansion of AS-interface networks via engineering in the TIA Portal.

Up to eight CM AS-i Master ST units can be plugged into one ET 200SP station with IM 155-6 PN Standard. The maximum configuration depends on the interface module used.

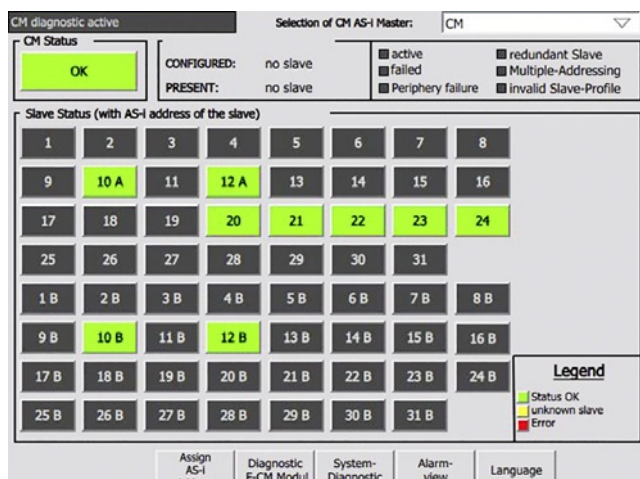
Multiple masters as well as single masters can thus be implemented in the ET 200SP depending on the number of modules.

Together with the interface module, a scalable PROFINET/AS-i Link or PROFIBUS/AS-i Link can be assembled.

Using STEP 7, the AS-i network is consistently configured and programmed with only one configuration tool.

The PRONETA PC program (for ET 200SP with PROFINET interface module) is available for convenient input/output testing during the commissioning of an AS-i network without a CPU, see <http://www.siemens.com/proneta>.

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see <https://support.industry.siemens.com/cs/ww/en/view/109479103>.



Diagnostics data call for CM AS-i Master

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM AS-i Master ST for SIMATIC ET 200SP

Ordering data

Ordering data	Article No.	Ordering data	Article No.
CM AS-i Master ST communication module <ul style="list-style-type: none"> 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 	3RK7137-6SA00-0BC1	PROFINET IM 155-6 PN High Speed interface module <p>Max. 30 I/O modules, max. 1 440 bytes I/O data per station</p> <ul style="list-style-type: none"> Including server module (bus adapter must be ordered separately, see below) 	6ES7155-6AU00-0DN0
Accessories		PROFIBUS IM 155-6 DP High Feature interface module <p>Max. 32 I/O modules, max. 244 bytes I/O data per station</p> <ul style="list-style-type: none"> Including server module and PROFIBUS connector 	6ES7155-6BA00-0CN0
BaseUnit BU20-P6+A2+4D <ul style="list-style-type: none"> 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 For spring-type terminals 	6ES7193-6BP20-0DC0	BusAdapters for PROFINET <p>For connection of the Ethernet cable to the PROFINET IM 155-6 PN interface module</p> <ul style="list-style-type: none"> 2 x RJ45 connection (supplied without RJ45 plug) 2 x FC connection (FastConnect) <p>For more bus adapters with fiber-optic cable connection, see Catalog IK PI or the Industry Mall.</p>	6ES7193-6AR00-0AA0 6ES7193-6AF00-0AA0
PROFINET IM 155-6 PN Basic interface module <p>Max. 12 I/O modules, max. 32 bytes I/O data per station</p> <ul style="list-style-type: none"> Including server module and BusAdapter 2 x RJ45 ports (supplied without RJ45 plug) 	6ES7155-6AR00-0AN0	AS-interface addressing unit V3.0 <ul style="list-style-type: none"> For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i Specification V3.0 For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves) With input/output test function and many other commissioning functions Battery operation with four batteries type AA (IEC LR6, NEDA 15) Degree of protection IP40 Dimensions (W x H x D) mm: 84 x 195 x 35 Scope of supply: <ul style="list-style-type: none"> - Addressing unit with 4 batteries - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m 	3RK1904-2AB02
PROFINET IM 155-6 PN Standard interface modules <p>Max. 32 I/O modules, max. 256 bytes I/O data per station</p> <ul style="list-style-type: none"> Including server module and bus adapter 2 x RJ45 (supplied without RJ45 plug) Including server module (bus adapter must be ordered separately, see right) 	6ES7155-6AA01-0BN0 6ES7155-6AU01-0BN0		
PROFINET IM 155-6 PN High Feature interface modules <p>Max. 64 I/O modules, max. 1 440 bytes I/O data per station</p> <ul style="list-style-type: none"> IM 155-6 PN/2 High Feature IM with a bus adapter slot including server module and optional strain relief (bus adapter must be ordered separately, see right) IM 155-6 PN/3 High Feature 3-port IM with two bus adapter slots including server module and optional strain relief (bus adapter must be ordered separately, see right) 	6ES7155-6AU01-0CN0 6ES7155-6AU30-0CN0		

More information

SIMATIC ET200SP Manual Collection, [see https://support.industry.siemens.com/cs/ww/en/view/84133942](https://support.industry.siemens.com/cs/ww/en/view/84133942)

Diagnostic blocks with visualization, [see https://support.industry.siemens.com/cs/ww/en/view/109479103](https://support.industry.siemens.com/cs/ww/en/view/109479103)

AS-Interface block library for SIMATIC PCS 7 for simple connection of AS-Interface to PCS 7, [see https://support.industry.siemens.com/cs/ww/en/view/109759605](https://support.industry.siemens.com/cs/ww/en/view/109759605)

Released combinations of the AS-i modules for ET 200SP, [see https://support.industry.siemens.com/cs/ww/en/view/103624653](https://support.industry.siemens.com/cs/ww/en/view/103624653)

Overview



- PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps
- 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 Kbps to 12 Mbps
- 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
General information	
Product type designation	CM PROFIBUS DP
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 Update 3
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	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
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

Article number	6ES7545-5DA00-0AB0
	ET 200SP, CM DP for ET 200SP CPU
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
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Diagnostics indication LED	
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
between backplane bus and interface	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
Dimensions	
Width	35 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	80 g

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC 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 Mbps	6ES7545-5DA00-0AB0	PROFIBUS DP RS 485 bus connector With 90° cable outlet, max. transfer rate 12 Mbps <ul style="list-style-type: none"> • without PG interface • with PG interface 	6ES7972-0BA12-0XA0 6ES7972-0BB12-0XA0
Accessories			
Equipment labeling plate 10 sheets of 16 labels	6ES7193-6LF30-0AW0	With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps <ul style="list-style-type: none"> • 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
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	FastConnect bus cable Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1830-0EH10

Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

G...JK10...XX...50730

The CP 1543SP-1 communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks. By combining a variety of security features such as an SPI (Stateful Packet Inspection) firewall, VPN and data encryption protocols (e.g. SNMPv3), the communications

processor protects individual ET 200SP distributed controllers or even entire automation cells against unauthorized access.

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions can be configured with STEP 7 Professional, V14 (TIA Portal) and higher.

The CP 1543SP-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
 - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
- Support of SINEMA Remote Connect with autoconfiguration
- Security Integrated
 - Stateful Packet Inspection Firewall
 - Secure communication via VPN (IPsec)
- Protocols for secure communication
 - Secure access to the web server of the CPU via the HTTPS protocol
 - Secure transfer of the time of day (NTP)
 - SNMPv3 for tap-proof transfer of network analysis information
- Integration of the ET 200SP Distributed Controller into IPv6-based networks

Technical specifications

Article number	6GK7543-6WX00-0XE0
Product type designation	CP 1543SP-1
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	19.2 ... 28.8 V
Power loss [W]	6 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 50 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20

Article number	6GK7543-6WX00-0XE0
Product type designation	CP 1543SP-1
Design, dimensions and weight	
Width	60 mm
Height	117 mm
Depth	74 mm
Net weight	0.18 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	2
• Note	2 CPs can be plugged in per CPU, simultaneous operation with BA Send and CM DP is possible
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	32
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CP 1543SP-1

Technical specifications (continued)

Article number	6GK7543-6WX00-0XE0
Product type designation	CP 1543SP-1
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	32
Performance data IT functions	
Number of possible connections	
• as e-mail client maximum	1
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
Identification & maintenance function	
• I&MO - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via ET 200SP CPU

Article number	6GK7543-6WX00-0XE0
Product type designation	CP 1543SP-1
Product functions Security	
Firewall version	stateful inspection
Product function with VPN connection	IPSec, SINEMA RC
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1
Number of possible connections with VPN connection	4
Product function	
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	Yes
• log file for unauthorized access	Yes
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	No
Protocol is supported	
• NTP	Yes
• NTP (secure) time synchronization	Yes
• from NTP-server	Yes

Ordering data

Ordering data	Article No.	Article No.
CP 1543SP-1 communications processor CP 1543SP-1 communications processor for connecting SIMATIC S7-ET 200SP to Industrial Ethernet, Security (firewall and VPN), open IE communication (TCP/IP, ISO-on-TCP, UDP) PG/OP, S7 routing, IP broadcast/multicast, SNMPV1/V3, DHCP, secure email, IPV4/IPV6, time synchronization via NTP, access to web server of CPU, bus adapter required	6GK7543-6WX00-0XE0	SIMATIC BusAdapter BA 2xSCRJ For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)
Accessories		6ES7193-6AP00-0AA0
SIMATIC BusAdapter BA 2xRJ45 For PROFINET interface modules, standard function class or above; max. cable length 50 m	6ES7193-6AR00-0AA0	SIMATIC BusAdapter BA SCRJ/RJ45 For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)
SIMATIC BusAdapter BA 2xFC For PROFINET interface modules, standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	6ES7193-6AF00-0AA0	SIMATIC BusAdapter BA SCRJ/FC For PROFINET interface modules, High Feature function class or above; with media converter FOC-cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)

Ordering data	Article No.	Ordering data	Article No.
IE FC RJ45 plug 180 2 x 2 RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface <ul style="list-style-type: none"> • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units 	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00
IE FC RJ45 plug 4 x 2 RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface <ul style="list-style-type: none"> • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units 	6GK1901-1BB11-2AA0 6GK1901-1BB11-2AB0 6GK1901-1BB11-2AE0	Labeling strips 500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer 500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer 1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer 1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0
IE FC TP standard cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1840-2AH10	Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0
IE FC TP standard cable GP 4 x 2 8-wire, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m <ul style="list-style-type: none"> • AWG22, for connection to IE FC RJ45 modular outlet • AWG24, for connection to IE FC RJ45 plug 4 x 2 	6XV1870-2E 6XV1878-2A	Spare parts Server module Terminates an ET 200SP station; included in the scope of supply of the interface modules	6ES7193-6PA00-0AA0
		PE connection element for standard rail 2000 mm 20 units	6ES7590-5AA00-0AA0
		Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals	6ES7193-4JB00-0AA0

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CP 1542SP-1

Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

The CP 1542SP-1 communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks.

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions are configured using STEP 7 Professional V14 (TIA Portal) or higher.

The CP 1542SP-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
 - Sending emails via SMTP for authentication on an email server (also with IPv6)
 - SNMPv1 for transfer of network analysis information
- Integration of the ET 200SP Distributed Controller into IPv6-based networks

Technical specifications

Article number	6GK7542-6UX00-0XE0
Product type designation	CP 1542SP-1
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	19.2 ... 28.8 V
Power loss [W]	6 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 50 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20

Article number	6GK7542-6UX00-0XE0
Product type designation	CP 1542SP-1
Design, dimensions and weight	
Width	60 mm
Height	117 mm
Depth	74 mm
Net weight	0.18 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	2
• Note	2 CPs can be plugged in per CPU, simultaneous operation with BA Send and CM DP is possible
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	32
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	32

Technical specifications (continued)

Article number	6GK7542-6UX00-0XE0
Product type designation	CP 1542SP-1
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v3	No
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
Identification & maintenance function	
• I&MO - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes

Article number	6GK7542-6UX00-0XE0
Product type designation	CP 1542SP-1
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via ET 200SP CPU
Product functions Security	
Product function	
• Blocking of communication via physical ports	Yes
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	No
Protocol is supported	
• NTP	Yes
• NTP (secure)	No
time synchronization	
• from NTP-server	Yes

Ordering data

	Article No.
CP 1542SP-1 communications processor For connection of SIMATIC S7 ET 200SP to Industrial Ethernet, open IE communication (TCP/ IP, ISO-ON-TCP, UDP), PG/OP, S7 routing, IP broadcast/multicast, SNMPV1, DHCP, email, IPv4/IPv6, time synchronization via NTP, access to web server of CPU, bus adapter required	6GK7542-6UX00-0XE0
Accessories	
SIMATIC BusAdapter BA 2xRJ45 For PROFINET interface modules, standard function class or above; max. cable length 50 m	6ES7193-6AR00-0AA0
SIMATIC BusAdapter BA 2xFC For PROFINET interface modules, standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	6ES7193-6AF00-0AA0
SIMATIC BusAdapter BA 2xSCRJ For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	6ES7193-6AP00-0AA0
SIMATIC BusAdapter BA SCRJ/RJ45 For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	6ES7193-6AP20-0AA0

	Article No.
SIMATIC BusAdapter BA SCRJ/FC For PROFINET interface modules, High Feature function class or above; with media converter FOC-cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	6ES7193-6AP40-0AA0
IE FC RJ45 plug 180 2 x 2 RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU 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 RJ45 plug 4 x 2 RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface	
• 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units	6GK1901-1BB11-2AA0 6GK1901-1BB11-2AB0 6GK1901-1BB11-2AE0
IE FC TP standard cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1840-2AH10

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CP 1542SP-1

Ordering data	Article No.	Ordering data	Article No.
IE FC TP standard cable GP 4 x 2 8-wire, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m <ul style="list-style-type: none"> • AWG22, for connection to IE FC RJ45 modular outlet • AWG24, for connection to IE FC RJ45 plug 4 x 2 	6XV1870-2E 6XV1878-2A	Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00	Spare parts Server module Terminates an ET 200SP station; included in the scope of supply of the interface modules	6ES7193-6PA00-0AA0
Labeling strips 500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer 500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer 1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer 1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0	PE connection element for standard rail 2000 mm 20 units	6ES7590-5AA00-0AA0
		Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals	6ES7193-4JB00-0AA0

Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

G...JK10...XX...50730

The CP 1542SP-1 IRC communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks. In addition, control centers can be connected using various telecontrol protocols.

The CP is characterized by the following:

- Ethernet-based connection to TeleControl Server Basic, e.g. via Internet
- Ethernet-based connection to the control center via SINAUT ST7, IEC 60870-5-104 or DNP3 protocol
- Data transfer of measured values, control variable values or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Data buffering of up to 100,000 values ensures a secure database, even with temporary connection failures
- Clearly laid out LED signaling for fast and easy diagnostics
- Fast commissioning thanks to easy configuration using STEP 7

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions are configured using STEP 7 Professional V14 (TIA Portal) or higher.

The CP 1542SP-1 IRC supports the following communication services:

- Support of multiple telecontrol protocols such as SINAUT ST7, DNP3, IEC 60870-5-104 and TeleControl Basic
- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
 - Sending emails via SMTP or SMTPS with "SMTP-Auth" for authentication on an email server (also with IPv6)
 - Email transfer with addressing by program block
 - Email transfer via "Notifications" (alerts)
- Support of SINEMA Remote Connect with autoconfiguration

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CP 1542SP-1 IRC

Technical specifications

Article number	6GK7542-6VX00-0XE0
Product type designation	CP 1542SP-1 IRC
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	19.2 ... 28.8 V
Power loss [W]	6 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 50 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Width	60 mm
Height	117 mm
Depth	74 mm
Net weight	0.18 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	2
• Note	2 CPUs can be plugged in per CPU, simultaneous operation with BA Send and CM DP is possible
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	32
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16

Article number	6GK7542-6VX00-0XE0
Product type designation	CP 1542SP-1 IRC
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	32
Performance data IT functions	
Number of possible connections	
• as e-mail client maximum	1
Performance data telecontrol	
Suitability for use	
• Node station	No
• substation	Yes
• TIM control center	No
Control center connection	IEC 60870-5, DNP3, (Modbus TCP by block solutions of the CPU) capable control stations, connection to Telecontrol Server Basic and ST7 capable control station
• by means of a permanent connection	supported
• by means of demand-oriented connection	supported
• Note	Connection to SCADA system by IEC 60870-5 104, DNP3, Telecontrol Server Basic and ST7 capable control center
Protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
• SINAUT ST7 protocol	Yes
Product function data buffering if connection is aborted	Yes
Number of data points per station maximum	500
Number of stations for direct communication with Telecontrol Server Basic	
• in send direction maximum	3
• in receive direction maximum	15
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v3	No
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher-level designation/location designation	Yes

Technical specifications (continued)

Article number	6GK7542-6VX00-0XE0
Product type designation	CP 1542SP-1 IRC
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via ET 200SP CPU
Product functions Security	
Product function with VPN connection	SINEMA RC
Product function	Yes
• Blocking of communication via physical ports	Yes

Article number	6GK7542-6VX00-0XE0
Product type designation	CP 1542SP-1 IRC
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported	
• NTP	Yes
• NTP (secure) time synchronization	No
• from NTP-server	Yes
• from control center	Yes

Ordering data

Ordering data	Article No.	Ordering data	Article No.
CP 1542SP-1 IRC communications processor CP 1542SP-1 IRC communications processor for connection of SIMATIC S7 ET 200SP to Industrial Ethernet, TeleControl Server Basic, IEC 60870-5-104 or DNP3 protocol to a control center; open IE communication (TCP/IP, ISO-on-TCP, UDP), IP broadcast/multicast, SNMPV1, DHCP, secure email, IPV4/IPV6, time synchronization via NTP, access to web server of CPU, bus adapter required	6GK7542-6VX00-0XE0	SIMATIC BusAdapter BA SCRJ/RJ45 For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	6ES7193-6AP20-0AA0
Accessories		SIMATIC BusAdapter BA SCRJ/FC For PROFINET interface modules, High Feature function class or above; with media converter FOC-cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	6ES7193-6AP40-0AA0
SIMATIC BusAdapter BA 2xRJ45 For PROFINET interface modules, standard function class or above; max. cable length 50 m	6ES7193-6AR00-0AA0	IE FC RJ45 plug 180 2 x 2 RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
SIMATIC BusAdapter BA 2xFC For PROFINET interface modules, standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	6ES7193-6AF00-0AA0	• 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0
SIMATIC BusAdapter BA 2xSCRJ For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	6ES7193-6AP00-0AA0		

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CP 1542SP-1 IRC

Ordering data	Article No.	Article No.
IE FC RJ45 plug 4 x 2 RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface <ul style="list-style-type: none"> • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units 	6GK1901-1BB11-2AA0 6GK1901-1BB11-2AB0 6GK1901-1BB11-2AE0	Labeling strips 500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer 500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer 1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer 1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer
IE FC TP standard cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1840-2AH10	Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter
IE FC TP standard cable GP 4 x 2 8-wire, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m <ul style="list-style-type: none"> • AWG22, for connection to IE FC RJ45 modular outlet • AWG24, for connection to IE FC RJ45 plug 4 x 2 	6XV1870-2E 6XV1878-2A	Spare parts Server module Terminates an ET 200SP station; included in the scope of supply of the interface modules PE connection element for standard rail 2000 mm 20 units Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0 6ES7193-6LF30-0AW0 6ES7193-6PA00-0AA0 6ES7590-5AA00-0AA0 6ES7193-4JB00-0AA0

Overview



Space-saving access point, suitable for applications where the device is to be mounted in the control cabinet

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
• for Industrial Ethernet	10, 100 Mbit/s
Transfer rate for Industrial Ethernet	
• minimum	10 Mbit/s
• maximum	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 feature 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	
• at DC at 24 V typical	0.15 A
Power loss [W]	
• at 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

¹⁾ Wireless approval in the USA

I/O SystemsSIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP**I/O modules > Communication > SCALANCE W761 RJ45 for 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
• 35 mm DIN rail mounting	Yes
• 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	
• iPCF Access Point	No
• iPCF client	No
• iPCF-MC Access Point	No
• iPCF-MC client	No
Product function iREF	No
Product function iPRP	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 email	Yes
• Configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• operation with IWLAN controller	No
• operation with Enterasys WLAN controller	No
• forced roaming on IP down with IWLAN	Yes
• forced roaming on link down with IWLAN	Yes
• WDS	Yes
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	Yes

Article number	6GK5761-1FC00-0AA0 6GK5761-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W761-1 RJ45
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher-level designation/location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	No
• 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	Yes
• DHCP Option 82	Yes
Product functions Redundancy	
Protocol is supported	
• STP/RSTP	Yes
• MSTP	Yes
• RSTP	Yes
Product functions Security	
Product function	
• ACL - MAC-based	Yes
• 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
• RADIUS	Yes
Product functions Time	
Protocol is supported	
• NTP	Yes
• SNTP	Yes
• SIMATIC Time	Yes

1) Wireless approval in the USA

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
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Railway application in accordance with EN 50121-4	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

Article number	6GK5761-1FC00-0AA0 6GK5761-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W761-1 RJ45
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
• DNV GL	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
• Royal Institution of Naval Architects (RINA)	No
Accessories	
accessories	24 V DC screw terminal included in scope of delivery

¹⁾ Wireless approval in the USA

Ordering data
Access Points SCALANCE W761

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 Mbps; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of supply: Mounting hardware, 3-pin screw terminal for 24 V 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⁾

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

Article No.
6GK5761-1FC00-0AA0
6GK5761-1FC00-0AB0
6GK1901-1BB10-2AA0
6GK1901-1BB10-2AB0
6GK1901-1BB10-2AE0
Article No.
IE FC TP standard cable GP 2 x 2

4-wire, 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. delivery unit 1000 m, minimum order quantity 20 m

IE FC stripping tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

Antennas and miscellaneous IWLAN accessories
6XV1840-2AH10
6GK1901-1GA00

See Industry Mall

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

I/O Systems

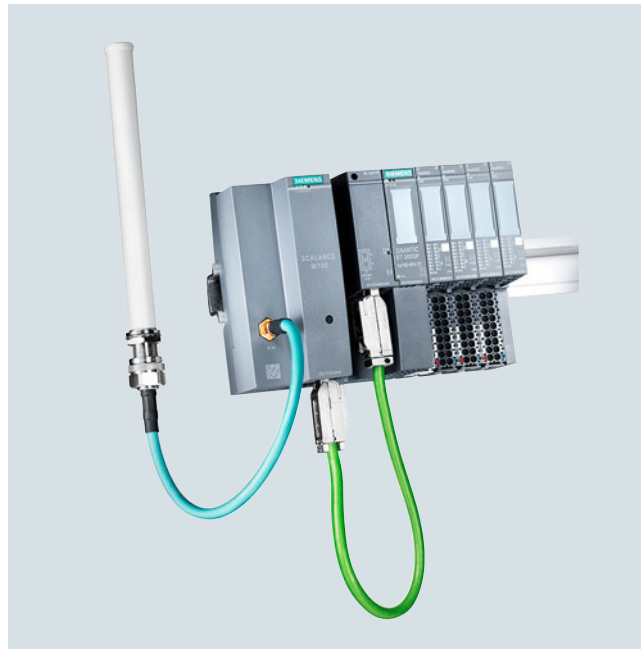
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W722 RJ45 for the control cabinet

Overview



- Space-saving 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

Technical specifications

Article number	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0 ¹⁾ 6GK5722-1FC00-0AC0 ²⁾
Product type designation	SCALANCE W722-1 RJ45
Transmission rate	
Transfer rate	
• with WLAN maximum	150 Mbit/s
• for Industrial Ethernet	10, 100 Mbit/s
Transfer rate for Industrial Ethernet	
• minimum	10 Mbit/s
• maximum	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

Article number	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0 ¹⁾ 6GK5722-1FC00-0AC0 ²⁾
Product type designation	SCALANCE W722-1 RJ45
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 feature 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	
• at DC at 24 V typical	0.15 A
Power loss [W]	
• at DC at 24 V typical	3.6 W

¹⁾ Wireless approval in the USA

²⁾ Wireless approval in Israel

Technical specifications (continued)

Article number	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0 ¹⁾ 6GK5722-1FC00-0AC0 ²⁾
Product type designation	SCALANCE W722-1 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
• 35 mm DIN rail mounting	Yes
• 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	
• iPCF client	Yes
• iPCF-MC client	Yes
Number of iPCF-capable radio modules	1
Product function iPRP	Yes

Article number	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0 ¹⁾ 6GK5722-1FC00-0AC0 ²⁾
Product type designation	SCALANCE W722-1 RJ45
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 email	Yes
• Configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• 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
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	Yes
• Link Check	No
• connection monitoring IP-Alive	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

1) Wireless approval in the USA

2) Wireless approval in Israel

I/O SystemsSIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP**I/O modules > Communication > SCALANCE W722 RJ45 for the control cabinet****Technical specifications (continued)**

Article number	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0 ¹⁾ 6GK5722-1FC00-0AC0 ²⁾
Product type designation	SCALANCE W722-1 RJ45
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	Yes
• DHCP Option 82	Yes
Product functions Redundancy	
Protocol is supported	
• STP/RSTP	Yes
• MSTP	Yes
• RSTP	Yes
Product functions Security	
Product function	
• ACL - MAC-based	Yes
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	Yes
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes
• RADIUS	Yes
Product functions Time	
Protocol is supported	
• NTP	Yes
• SNTP	Yes
• SIMATIC Time	Yes

Article number	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0 ¹⁾ 6GK5722-1FC00-0AC0 ²⁾
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
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• E1 approval	No
• Railway application in accordance with EN 50155	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
• DNV GL	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
• Royal Institution of Naval Architects (RINA)	No
Accessories	
accessories	24 V DC screw terminal included in scope of delivery

¹⁾ Wireless approval in the USA²⁾ Wireless approval in Israel

Ordering data	Article No.	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 Mbps; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of supply: Mounting hardware, 3-pin screw terminal for 24 V 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 <ul style="list-style-type: none"> National approvals for operation outside the USA National approvals for operation within the USA¹⁾ National approvals for operation in Israel²⁾ 	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0 6GK5722-1FC00-0AC0	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 IE FC TP standard cable GP 2 x 2 4-wire, 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. delivery unit 1000 m, minimum order quantity 20 m IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables Antennas and miscellaneous IWLAN accessories	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0 6XV1840-2AH10 6GK1901-1GA00 See Industry Mall

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

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W721 RJ45 for the control cabinet

Overview



Space-saving client module, suitable for applications where the device is to be mounted in the control cabinet

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
• for Industrial Ethernet	10, 100 Mbit/s
Transfer rate for Industrial Ethernet	
• minimum	10 Mbit/s
• maximum	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 feature external antenna can be mounted directly on device	Yes

Article number	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W721-1 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	
• at DC at 24 V typical	0.15 A
Power loss [W]	
• at 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

¹⁾ Wireless approval in the USA

Technical specifications (continued)

Article number	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W721-1 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
• 35 mm DIN rail mounting	Yes
• 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	
• iPCF client	No
• iPCF-MC client	No
Product function iREF	No
Product function iPRP	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 email	Yes
• Configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• 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&MO - device-specific information	Yes
• I&M1 – higher-level designation/location designation	Yes

Article number	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W721-1 RJ45
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	No
• Link Check	No
• connection monitoring IP-Alive	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	Yes
• DHCP Option 82	Yes
Product functions Redundancy	
Protocol is supported	
• STP/RSTP	Yes
• MSTP	Yes
• RSTP	Yes
Product functions Security	
Product function	
• ACL - MAC-based	Yes
• 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
• RADIUS	Yes
Product functions Time	
Protocol is supported	
• NTP	Yes
• SNTP	Yes
• SIMATIC Time	Yes

¹⁾ Wireless approval in the USA

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W721 RJ45 for the control cabinet

Technical specifications (continued)

Article number	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W721-1 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 Certificate of suitability	UL 60950-1 CSA C22.2 No. 60950-1
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• E1 approval	No
• Railway application in accordance with EN 50155	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

Article number	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0 ¹⁾
Product type designation	SCALANCE W721-1 RJ45
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
• DNV GL	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
• Royal Institution of Naval Architects (RINA)	No
Accessories	
accessories	24 V DC screw terminal included in scope of delivery

¹⁾ Wireless approval in the USA

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 Mbps; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of supply: Mounting hardware, 3-pin screw terminal for 24V DC; manual on CD-ROM; German/English

SCALANCE W721-1 RJ45

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

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

6GK5721-1FC00-0AA0

6GK5721-1FC00-0AB0

Article No.

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 TP standard cable GP 2 x 2

4-wire, 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. delivery unit 1000 m, minimum order 20 m

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 Industry Mall

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

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 Kbps, 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 bps
- 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 No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- 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	6AG1137-6AA00-2BA0
Based on	6ES7137-6AA00-0BA0 SIPLUS ET 200SP CM PTP
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM PtP serial interface

Ordering data	Article No.	Further accessories	Article No.
SIPLUS CM PtP communication module (Extended temperature range and medial exposure) PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps for serial communication connections with the interfaces RS 232, RS 422, RS 485, BU type A0, color code CC00	6AG1137-6AA00-2BA0	See SIMATIC CM PtP, page 9/118	
Accessories SIPLUS BaseUnits type A0 (Extended temperature range and medial exposure)			
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA0		
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0		
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in 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 BU type A0; BaseUnit (dark) with 16 push-in 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		

Overview



- SIPLUS CM 4x 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.
- Time-based IO
Time-based IO ensures that signals are output with a precisely defined response time. By combining inputs and outputs, for example, passing products can be accurately measured or fluids dosed in precise quantities.
- Supported data transfer rates
 - COM1 (4.8 kBd)
 - COM2 (38.4 kBd)
 - COM3 (230.4 kBd)
- Expansion limits
 - Length of cable: Max. 20 m
 - Max. 32 bytes of input and output data per port
 - Max. 144 bytes of input data and 128 bytes of output data per module
- Supported ET 200SP system functions
 - Replacement without PG with automatic backup without the engineering tool of the IO-Link Device Parameter (V1.1 devices only) and the IO-Link master parameters by means of redundant saving of parameters on the e-coding element
 - Re-parameterization 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 No.
- Optional accessories
 - Labeling strips
 - Equipment labeling plate
 - Color-coded label with color code CC04
- 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.

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM 4x IO-Link

Technical specifications

Article number	6AG1137-6BD00-2BA0
Based on	6ES7137-6BD00-0BA0 SIPLUS ET 200SP CM 4XIO-LINK
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

Article No.

SIPLUS CM 4x IO-Link Master V1.1 Standard communication module	6AG1137-6BD00-2BA0
(Extended temperature range and exposure to media)	
Serial communication module for connecting up to 4 IO-Link devices, time-based IO, BU type A0, color code CC04	
Usable type A0 BaseUnits	
BU15-P16+A10+2D	6AG1193-6BP20-7DA0
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (light) with 16 push-in terminals (1... 16) to the module and additionally 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
BU15-P16+A0+2D	6AG1193-6BP00-7DA0
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A10+2B	6AG1193-6BP20-7BA0
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
BU15-P16+A0+2B	6AG1193-6BP00-7BA0
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
Accessories	See SIMATC CM 4x IO-Link, page 9/121

Overview



- PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps
- 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 kbps to 12 Mbps
- 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

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	6AG1545-5DA00-2AB0
Based on	6ES7545-5DA00-0AB0 SIPLUS ET 200SP CM DP
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)

Article number	6AG1545-5DA00-2AB0
Based on	6ES7545-5DA00-0AB0 SIPLUS ET 200SP CM DP
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM DP for ET 200SP CPU

Technical specifications (continued)

Article number	6AG1545-5DA00-2AB0	Article number	6AG1545-5DA00-2AB0
Based on	6ES7545-5DA00-0AB0 SIPLUS ET 200SP CM DP	Based on	6ES7545-5DA00-0AB0 SIPLUS ET 200SP CM DP
Use on ships/at sea		Conformal coating	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
Remark		• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!		

Ordering data**SIPLUS CM DP for ET 200SP CPU**

(Extended temperature range and medial exposure)

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

Article No.**6AG1545-5DA00-2AB0****Article No.****Accessories**

see SIMATIC CM DP, page 9/126

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 No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- 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	6ES7136-6BA00-0CA0 ET 200SP, EI-Mod., F-DI 8x24VDC HF
General information	
Product type designation	F-DI 8x24VDC HF
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V12
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
Supply voltage	
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; Total current of all encoders

Article number	6ES7136-6BA00-0CA0 ET 200SP, EI-Mod., F-DI 8x24VDC HF
Digital inputs	
Number of digital inputs	8
Source/sink input	Yes; P-reading
Input characteristic curve in accor- dance with IEC 61131, type 1	Yes
Input voltage	
• 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 technological functions	
- parameterizable	No

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-input modules

Technical specifications (continued)

Article number	6ES7136-6BA00-0CA0 ET 200SP, EI-Mod., F-DI 8x24VDC HF
Interrupts/diagnostics/ status information	
Diagnostics function	Yes, "Alarms/diagnostic messages" section in the manual
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
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes

Article number	6ES7136-6BA00-0CA0 ET 200SP, EI-Mod., F-DI 8x24VDC HF
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during 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
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	49 g

Ordering data

Article No.

Digital F-input modules

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

6ES7136-6BA00-0CA0

Suitable BaseUnits

BU15-P16+A10+2D

BU type A0; BaseUnit (light)
with 16 push-in 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+A0+2D

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

- 1 unit
- 10 units

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

2BU15-P16+A0+2DB

Double BaseUnit for holding
2 I/O modules;
BU type A0; BaseUnit (light/dark)
with 16 push-in terminals to the
module; for starting a new load
group (max. 10 A)

- 1 unit

6ES7193-6BP60-0DA0

Article No.

BU15-P16+A10+2B

BU type A0; BaseUnit (dark)
with 16 push-in 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

BU15-P16+A0+2B

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

- 1 unit
- 10 units

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

2BU15-P16+A0+2B

Double BaseUnit for holding
2 I/O modules;
BU type A0; BaseUnit (dark/dark)
with 16 push-in terminals to the
module; for continuing the load
group

- 1 unit

6ES7193-6BP60-0BA0

Ordering data	Article No.	Ordering data	Article No.
Accessories		Equipment labeling plate	6ES7193-6LF30-0AW0
S7 Distributed Safety V5.4 SP5 Update 2 programming tool		10 sheets of 16 labels	
Task: Configuration software 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, ET 200SP		Labeling strips	
Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1 Please also consider the operating systems that have been released for the used STEP 7 version		500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	6ES7833-1FC02-0YA5	500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0
Floating license for 1 user; software, documentation and license key for download ¹⁾ ; email address required for delivery	6ES7833-1FC02-0YH5	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
S7 Distributed Safety Upgrade		BU cover	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	6ES7833-1FC02-0YE5	For covering empty slots (gaps); 5 units	
		• 15 mm wide	6ES7133-6CV15-1AM0
		• 20 mm wide	6ES7133-6CV20-1AM0
STEP 7 Safety Advanced V15.1		Shield connection	6ES7193-6SC00-1AM0
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O		5 shield supports and 5 shield terminals	
Requirement: STEP 7 Professional V15.1		Color-coded labels	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	6ES7833-1FA15-0YA5	• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	6ES7193-6CP01-2MA0
Floating license for 1 user, software, documentation and license key for download ¹⁾ ; email address required for delivery	6ES7833-1FA15-0YH5	• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units	6ES7193-6CP01-4MA0
		• 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	6ES7193-6EF00-1AA0
		5 units, spare part	

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

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-output modules

Overview



Digital fail-safe output modules:

- F-DQ 4x24VDC/2A PM High Feature
- F-DQ 8x24VDC/0.5A PP High Feature

Important features:

- 4 and 8-channel digital fail-safe output modules for the ET 200SP
- Fail-safe 2-channel activation (sink/source or source/source output) of actuators
- Actuators can be controlled up to 2 A or 0.5 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 DQ module type: black
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- 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	6ES7136-6DB00-0CA0 ET 200SP, EI-Mod., F-DQ 4xDC 24V/2A	6ES7136-6DC00-0CA0 ET 200SP, F-DQ 8x 24VDC/0.5A PP
General information		
Product type designation	F-DQ 4x24 V DC/2 A PM HF	F-DQ 8x24 V DC/0.5 A PP HF
Engineering with		
• STEP 7 TIA Portal configurable/integrated as of version	V12	V14 SP1 with HSP 202
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP4 HF5
• PROFINET as of GSD version/GSD revision	V2.31	
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Digital outputs		
Number of digital outputs	4	8
Digital outputs, parameterizable	Yes	Yes
Short-circuit protection	Yes	Yes
Open-circuit detection	Yes	No
Overload protection	Yes	
Limitation of inductive shutdown voltage to	Typ. -2x 47 V	Typ. -39 V
Controlling a digital input		Yes
Switching capacity of the outputs		
• with resistive load, max.	2 A	0.5 A
• on lamp load, max.	10 W	2 W

Technical specifications (continued)

Article number	6ES7136-6DB00-0CA0 ET 200SP, EI-Mod., F-DQ 4xDC 24V/2A	6ES7136-6DC00-0CA0 ET 200SP, F-DQ 8x 24VDC/0.5A PP
Load resistance range		
• lower limit	12 Ω	48 Ω
• upper limit	2 000 Ω	12 000 Ω
Output voltage		
• for signal "1", min.	24 V; L+ (-0.5 V)	24 V; L+ (-0.5 V)
Output current		
• for signal "1" rated value	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Switching frequency		
• with resistive load, max.	30 Hz; Symmetrical	30 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical
• with capacitive load, max.		2 Hz; Symmetrical
• on lamp load, max.	10 Hz; Symmetrical	10 Hz; Symmetrical
Total current of the outputs		
• Current per channel, max.	2 A; Note derating data in the manual	0.5 A; Note derating data in the manual
• Current per module, max.	6 A; Note derating data in the manual	3 A; Note derating data in the manual
Total current of the outputs (per module)		
horizontal installation		
- up to 40 °C, max.		3 A
- up to 50 °C, max.		2.5 A
- up to 60 °C, max.		2 A
vertical installation		
- up to 50 °C, max.		2 A
Cable length		
• shielded, max.	1 000 m	100 m
• unshielded, max.	500 m	100 m
Interrupts/diagnostics/status information		
Diagnostics function	Yes, "Alarms/diagnostic messages" section in the manual	Yes, "Alarms/diagnostic messages" section in the manual
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostics indication LED		
• RUN LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	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
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	Yes	Yes
Highest safety class achievable in safety mode		
• Performance level according to ISO 13849-1	PLe	PLe
• Category according to ISO 13849-1		Cat. 4
• SIL acc. to IEC 61508	SIL 3	SIL 3

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-output modules

Technical specifications (continued)

Article number	6ES7136-6DB00-0CA0	6ES7136-6DC00-0CA0
	ET 200SP, EI-Mod., F-DQ 4xDC 24V/2A	ET 200SP, F-DQ 8x 24VDC/0.5A PP
Ambient conditions		
Ambient temperature during 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
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	57 g	48 g

Ordering data

Ordering data	Article No.	Article No.
Digital F-output modules		
F-DQ 4x24 V DC High Feature, BU type A0, color code CC01	6ES7136-6DB00-0CA0	
F-DQ 8x24 V DC High Feature, PP-switching, BU type A0, color code CC01	6ES7136-6DC00-0CA0	
Suitable BaseUnits		
BU15-P16+A10+2D		
BU type A0; BaseUnit (light) with 16 push-in 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+A0+2D		
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)		
• 1 unit	6ES7193-6BP00-0DA0	
• 10 units	6ES7193-6BP00-2DA0	
2BU15-P16+A0+2DB		
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)		
• 1 unit	6ES7193-6BP60-0DA0	
BU15-P16+A10+2B		
BU type A0; BaseUnit (dark) with 16 push-in 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	
BU15-P16+A0+2B		
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group		
• 1 unit	6ES7193-6BP00-0BA0	
• 10 units	6ES7193-6BP00-2BA0	
2BU15-P16+A0+2B		
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group		
• 1 unit	6ES7193-6BP60-0BA0	
• 10 units	6ES7193-6BP60-2BA0	
Accessories		
S7 Distributed Safety V5.4 SP5 Update 2 programming tool		
Task: Configuration software 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, ET 200SP		
Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1 Please also consider the operating systems that have been released for the used STEP 7 version		
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive		6ES7833-1FC02-0YA5
Floating license for 1 user; software, documentation and license key for download ¹⁾ ; email address required for delivery		6ES7833-1FC02-0YH5

Ordering data	Article No.	Ordering data	Article No.
S7 Distributed Safety Upgrade From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	6ES7833-1FC02-0YE5	Shield connection 5 shield supports and 5 shield terminals	6ES7193-6SC00-1AM0
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1 Floating license for 1 user, software and documentation on DVD; license key on USB flash drive Floating license for 1 user, software, documentation and license key for download ¹⁾ ; email address required for delivery	6ES7833-1FA15-0YA5 6ES7833-1FA15-0YH5	Color-coded labels <ul style="list-style-type: none"> • Color code CC02, 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; 50 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 	6ES7193-6CP02-2MA0 6ES7193-6CP02-4MA0 6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0
Equipment labeling plate 10 sheets of 16 labels	6ES7193-6LF30-0AW0	E-coding element type F 5 units, spare part	6ES7193-6EF00-1AA0
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	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0		
BU cover For covering empty slots (gaps); 5 units <ul style="list-style-type: none"> • 15 mm wide • 20 mm wide 	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0		

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

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-output module relay

Overview



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

- 1 relay output (2 NO)
- 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 SIL 3 (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
General information	
Product type designation	F-RQ 1x24 V DC/24 ... 230 V AC/5 A
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13
• STEP 7 configurable/integrated as of version	V5.5 SP4 and higher
Supply voltage	
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 (acc. to IEC 60947-5-1, DC13), max.	0.1 Hz
• with inductive load (acc. 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 supply 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
Interrupts/diagnostics/ status information	
Diagnostics function	yes, firmware update
Diagnostics indication LED	
• RUN LED	Yes; green/red DIAG LED
• Channel status display	Yes; Green LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes

Technical specifications (continued)

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	
• Performance level according to ISO 13849-1	PLe
• Category according to ISO 13849-1	4
• SIL acc. to IEC 61508	SIL 3

Article number	6ES7136-6RA00-0BF0 ET 200SP, F-RQ 1x24VDC/ 24..230VAC/5A ST
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 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 SIL3/Cat.4/PL e if controlled via F-DQ	6ES7136-6RA00-0BF0
Usable BaseUnits	
BU20-P8+A4+0B BU type F0; BaseUnit (dark) with 8 push-in 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 V5.4 SP5 Update 2 programming tool Task: Configuration software 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, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1 Please also consider the operating systems that have been released for the used STEP 7 version Floating license for 1 user; software and documentation on DVD; license key on USB flash drive Floating license for 1 user; software, documentation and license key for download ¹⁾ ; email address required for delivery	6ES7833-1FC02-0YA5 6ES7833-1FC02-0YH5
S7 Distributed Safety Upgrade From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	6ES7833-1FC02-0YE5

	Article No.
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1 Floating license for 1 user, software and documentation on DVD; license key on USB flash drive Floating license for 1 user, software, documentation and license key for download ¹⁾ ; email address required for delivery	6ES7833-1FA15-0YA5 6ES7833-1FA15-0YH5
Equipment labeling plate 10 sheets of 16 labels	6ES7193-6LF30-0AW0
Labeling strips 500 labeling strips on roll, light gray	6ES7193-6LR10-0AA0
500 labeling strips on roll, yellow	6ES7193-6LR10-0AG0
1000 labeling strips DIN A4, light gray	6ES7193-6LA10-0AA0
1000 labeling strips DIN A4, yellow	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

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Analog F-input modules

Overview



Analog fail-safe input module:
F-AI 4xI 0(4) ... 20 mA 2/4-wire High Feature for BU type A0 and A1, color code CC00

Important properties:

- 4 analog inputs with galvanic isolation between channels and backplane bus (up to SIL 3/Cat. 4/PLd)
- Short-circuit-proof power supply of 2 or 4-wire transducers
- Measuring ranges: 0 ... 20 mA and 4 ... 20 mA
- Resolution: 16 bits including sign
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged onto type A0 and A1 BaseUnits (BU)
- LED display for errors, 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 BU terminals
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- 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	6ES7136-6AA00-0CA1 ET 200SP, F-AI 4XI (0)4...20mA HF
General information	
Product type designation	F-AI 4xl 0(4) ... 20 mA 2/4-wire HF
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15 with HSP 203
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog inputs	
Number of analog inputs	4
• For current measurement	4
permissible input current for current input (destruction limit), max.	35 mA
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	1 000 m
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 / 16,667
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz
Smoothing of measured values	
• Number of smoothing levels	7
• parameterizable	Yes
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	650 Ω
• for current measurement as 4-wire transducer	Yes
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.1 %
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.	40 dB
• Common mode interference, min.	70 dB

Article number	6ES7136-6AA00-0CA1 ET 200SP, F-AI 4XI (0)4...20mA HF
Interrupts/diagnostics/ status information	
Diagnostics function	Yes, "Alarms/diagnostic messages" section in the manual
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; Measuring range 4 to 20 mA only
• Short-circuit	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 LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• Category according to ISO 13849-1	Cat. 4
• SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 5.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
Ambient conditions	
Ambient temperature during 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
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	48 g

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Analog F-input modules

Ordering data	Article No.	Article No.
Analog fail-safe input module F-AI 4xI 0(4) ... 20 mA 2/4-wire High Feature, BU type A0, A1, color code CC00	6ES7136-6AA00-0CA1	
Suitable BaseUnits BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in 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) <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	
2BU15-P16+A0+2DB Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) <ul style="list-style-type: none"> • 1 unit 	6ES7193-6BP60-0DA0	
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group <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 push-in 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	
2BU15-P16+A0+2B Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group <ul style="list-style-type: none"> • 1 unit 	6ES7193-6BP60-0BA0	
BU15-P16+A0+12D/T BU type A1; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	6ES7193-6BP40-0DA1	
BU15-P16+A0+2D/T BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6ES7193-6BP00-0DA1	
BU15-P16+A0+12B/T BU type A1; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	6ES7193-6BP40-0BA1	
BU15-P16+A0+2B/T BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	6ES7193-6BP00-0BA1	
Accessories STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1 Floating license for 1 user, software and documentation on DVD; license key on USB flash drive Floating license for 1 user, software, documentation and license key for download ¹⁾ ; email address required for delivery		6ES7833-1FA15-0YA5 6ES7833-1FA15-0YH5
Equipment labeling plate 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 <ul style="list-style-type: none"> • 15 mm wide 		6ES7133-6CV15-1AM0
Shield connection 5 shield supports and 5 shield terminals		6ES7193-6SC00-1AM0
Color-coded labels <ul style="list-style-type: none"> • Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); A1; 10 units 		6ES7193-6CP00-2MA0

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

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 (IEC61508) (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 No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- 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, Power mod. F-PM-E PPM, 24V DC
General information	
Product type designation	F-PM-E 24 V DC/8 A PPM ST
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V12
• STEP 7 configurable/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	
Rated value (DC)	24 V
Reverse polarity protection	Yes
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; Total current of all encoders

Article number	6ES7136-6PA00-0BC0 ET 200SP, Power mod. F-PM-E PPM, 24V DC
Digital inputs	
Number of digital inputs	2
Source/sink input	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 technological functions	
- parameterizable	No
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	500 m

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Special fail-safe modules

Technical specifications (continued)

Article number	6ES7136-6PA00-0BC0 ET 200SP, Power mod. F-PM-E PPM, 24V DC
Digital outputs	
Number of digital outputs	1
Digital outputs, parameterizable	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 60947-5-1, DC-13, symmetrical
• on lamp load, max.	4 Hz; Symmetrical
Total 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
Interrupts/diagnostics/ status information	
Diagnostics function	Yes, "Alarms/diagnostic messages" section in the manual
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No

Article number	6ES7136-6PA00-0BC0 ET 200SP, Power mod. F-PM-E PPM, 24V DC
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
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Dimensions	
Width	20 mm
Height	73 mm
Depth	55 mm
Weights	
Weight, approx.	70 g

Ordering data

	Article No.
Digital F power module F-PM-E 24 V DC/8 A PPM Standard BU type C0, color code CC52. 2 inputs, 1 output, SIL3/Cat.4/PLe	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	6ES7193-6BP20-0DC0
Accessories	
Equipment labeling plate 10 sheets of 16 labels	6ES7193-6LF30-0AW0

Article No.

Labeling strips 1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0
BU cover for covering empty slots (gaps); 5 units • 20 mm wide	6ES7133-6CV20-1AM0
Shield connection 5 shield supports and 5 shield terminals	6ES7193-6SC00-1AM0
Color-coding plates • Color code CC52, module-specific, for 8 push-in terminals; 10 units	6ES7193-6CP52-2MC0
E-coding element type F 5 units, spare part	6ES7193-6EF00-1AA0

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 No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- 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

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	6AG1136-6BA00-2CA0
Based on	6ES7136-6BA00-0CA0 SIPLUS ET 200SP F-DI 4/8x24VDC HF
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 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	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	6AG1136-6BA00-2CA0
Based on	6ES7136-6BA00-0CA0 SIPLUS ET 200SP F-DI 4/8x24VDC HF
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

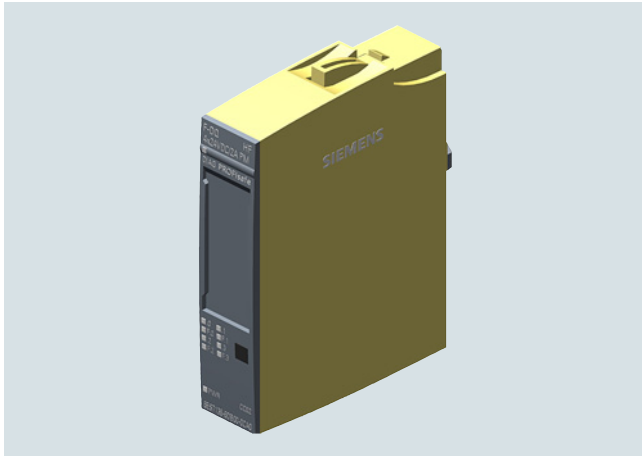
I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS digital F-input modules

Ordering data	Article No.	Accessories	Article No.
SIPLUS digital fail-safe input modules (Extended temperature range and exposure to media) F-DI 8x24 V DC High Feature, BU type A0, color code CC01	6AG1136-6BA00-2CA0	Accessories See SIMATIC ET 200SP, digital fail-safe input modules, page 9/155	
Usable BaseUnits BU15-P16+A0+2D (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA0		
BU15-P16+A0+2B (Extended temperature range and exposure to media) BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0		
BU15-P16+A10+2D (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 push-in 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 exposure to media) BU type A0; BaseUnit (dark) with 16 push-in 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		

Overview



Digital fail-safe output module:
F-DQ 4x24VDC 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) of 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
 - Equipment labeling plate
- 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

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	6AG1136-6DB00-2CA0	6AG1136-6DC00-2CA0
Based on	6ES7136-6DB00-0CA0	6ES7136-6DC00-0CA0
	SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF	SIPLUS ET 200SP F-DQ 8x24VDC/0.5A PP HF
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-25 °C	-25 °C; = Tmin
• horizontal installation, max.	60 °C	60 °C; = Tmax
• vertical installation, min.	-25 °C	-25 °C
• vertical installation, max.	50 °C	50 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 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 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS digital F-output modules

Technical specifications (continued)

Article number	6AG1136-6DB00-2CA0	6AG1136-6DC00-2CA0
Based on	6ES7136-6DB00-0CA0 SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF	6ES7136-6DC00-0CA0 SIPLUS ET 200SP F-DQ 8x24VDC/0.5A PP HF
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions		
Width	15 mm	15 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	57 g	48 g

Ordering data

Article No.

Article No.

SIPLUS digital fail-safe output modules

(Extended temperature range and exposure to environmental substances)

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

6AG1136-6DB00-2CA0

F-DQ 8x24 V DC High Feature, PP-switching, BU type A0, color code CC01

6AG1136-6DC00-2CA0

Usable BaseUnits

BU15-P16+A0+2D

6AG1193-6BP00-7DA0

(Extended temperature range and exposure to environmental substances)

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

BU15-P16+A10+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 push-in 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

BU20-P12+A4+0B

6AG1193-6BP20-7BB0

(Extended temperature range and exposure to environmental substances)

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

BU15-P16+A0+2B

6AG1193-6BP00-7BA0

(Extended temperature range and exposure to environmental substances)

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

Accessories

See SIMATIC ET 200SP, digital F-output modules, page 9/158

BU15-P16+A10+2D

6AG1193-6BP20-7DA0

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 push-in 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)

Overview



The digital F electronic module relay 1 F-RQ DC 24VDC/24.230VAC/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 SIL 3 (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).

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	6AG1136-6RA00-2BF0
Based on	6ES7136-6RA00-0BF0 SIPLUS ET 200SP F-RQ 24VDC/24-230VAC/5A
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; = Tmin
• horizontal installation, max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air

Article number	6AG1136-6RA00-2BF0
Based on	6ES7136-6RA00-0BF0 SIPLUS ET 200SP F-RQ 24VDC/24-230VAC/5A
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

Article No.

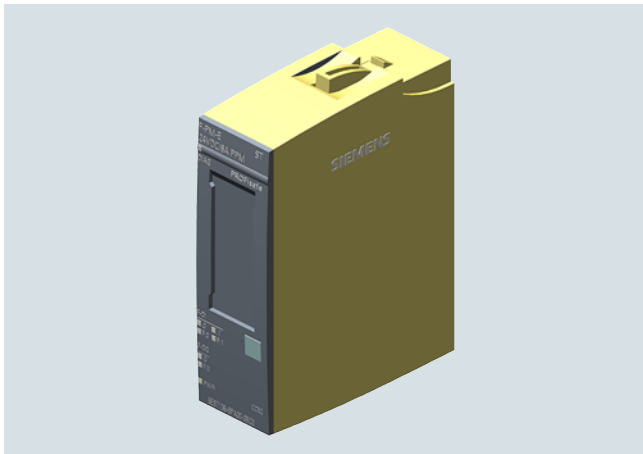
SIPLUS digital F-output module relay 1 F-RQ	
(Extended temperature range and exposure to media)	
BU type F0, relay output (2 NO contacts), total output current 5 A, load voltages 24 V DC and 24 ... 230 V AC; can be used up to SIL3/Category 4/PL e if controlled via F-DQ	6AG1136-6RA00-2BF0
Usable BaseUnits	
BU20-P8+A4+0B	6AG1193-6BP20-2BF0
(Extended temperature range and exposure to media)	
BU type F0; BaseUnit (dark) with 8 push-in terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group	
Accessories	See SIMATIC ET 200SP, digital F-output module relay, page 9/161

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS special fail-safe modules

Overview



Digital fail-safe power module:
F-PM-E PPM 24VDC/8A 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 configured
- Configurable onboard evaluation of the fail-safe inputs for control of the fail-safe digital output and of the potential group
- Digital standard output modules can be shut down up to PL d (ISO 13849) and SIL 2 (IEC61508) (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 No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- 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.

Note:

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

Technical specifications

Article number	6AG1136-6PA00-2BC0
Based on	6ES7136-6PA00-0BC0 SIPLUS ET 200SP F-PM-E 24VDC/8A PPM
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 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	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	6AG1136-6PA00-2BC0
Based on	6ES7136-6PA00-0BC0 SIPLUS ET 200SP F-PM-E 24VDC/8A PPM
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

Ordering data	Article No.
SIPLUS digital F power module F-PM-E 24 V DC/8 A PPM Standard (Extended temperature range and exposure to media) BU type C0, color code CC52. 2 inputs, 1 output, SIL3/Cat.4/PLe	6AG1136-6PA00-2BC0
Type C0 BaseUnits	
BU20-P6+A2+4D (Extended temperature range and exposure to media) BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new load group	6AG1193-6BP20-7DC0

Accessories	Article No.
	See SIMATIC ET 200SP, special fail-safe modules, page 9/166

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe modules > Fail-safe communication > F-CM AS-i Safety ST for SIMATIC 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 61508/EN 62061), 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. It can be used with fail-safe SIMATIC S7-300F/S7-400F CPUs and S7-1500F CPUs and also the fail-safe versions of the ET 200SP station with ET 200SP F-CPU 1510SP F / 1512SP F (firmware V1.8 or higher) or 1515SP PC F.
- For reading up to 31 fail-safe AS-i input slaves
 - Two sensor inputs/signals for each fail-safe AS-i input slave
 - Adjustable evaluation of sensor signals: two-channel or 2 x single-channel
 - Integrated discrepancy evaluation in the case of two-channel signals
 - Integrated AND operation in the case of 2 x single-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 an AS-i safety output module (e.g. SlimLine S45F safety module, Article No. 3RK1405-1SE15-0AA2; see <https://mall.industry.siemens.com/mall/en/WWW/Catalog/Products/10011823?tree=CatalogTree>).
 - 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)
- Informative automatic alarm indications (firmware V1.0.1 or higher)

- Supply via AS-Interface voltage
- Eight 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 No. and serial number)
 - Connection diagram
 - Color coding of the CM module type: light gray
 - Hardware and firmware version
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate

Design

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

One AS-i master according to the AS-i Specification V3.0, as well as fail-safe AS-i input slaves and/or AS-i safety output modules are needed for operation. The CM AS-i Master ST communication module (Article No. 3RK7137-6SA00-0BC1) is recommended as the AS-i master for the ET 200SP, see [page 9/122](#).

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, safety-oriented router between PROFINET (or PROFIBUS) and AS-Interface, which can be expanded further in a modular fashion.



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, additional local inputs and outputs can be realized so as to ensure that the modular AS-i router 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 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 to 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.

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions only represent one component of such a concept.

For more information on Industrial Security, 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 (TIA Portal) V13 and higher with HSP 0070¹⁾ and Safety Advanced.
For connection to S7-1500F you require STEP 7 V13 SP1. When configuring with STEP 7 V13 SP1, the latest version of HSP 0070 V2.0 (or higher) is an essential prerequisite. STEP 7 Safety V13 SP1 Update 4 and HSP 0070 V3.0 (or higher) are needed for configuration of the F-CM AS-i Safety ST module in an ET 200SP station with ET 200SP F-CPU 1510SP F / 1512SP F (firmware V1.8 or higher) or 1515SP PC F.

or

- STEP 7 (classic) V5.5 SP3 HF4 or higher with HSP 2093²⁾ and Distributed Safety V5.4 SP5 or F-Configuration Pack SP11 or SIMATIC S7 F/FH Systems

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

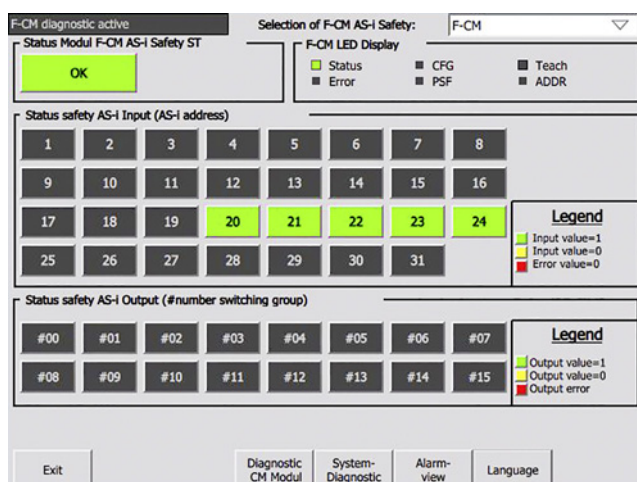
Data management – together with all other configuration data of the SIMATIC – is realized completely in the S7 project.

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.

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see <https://support.industry.siemens.com/cs/ww/en/view/109479103>.



Diagnostic block for F-CM AS-i Safety ST

- 1) HSP 0070 see <https://support.industry.siemens.com/cs/ww/en/view/72341852>.
- 2) HSP 2093 see <https://support.industry.siemens.com/cs/ww/en/view/23183356>.

Application

Thanks to use of the fail-safe module in the ET 200SP, it is possible to fulfill the safety-related application requirements in a manner that is integrated in the overall automation solution.

The safety functions required for fail-safe operation are integrated in the modules. Communication with the fail-safe SIMATIC S7 CPUs is realized via PROFIsafe.

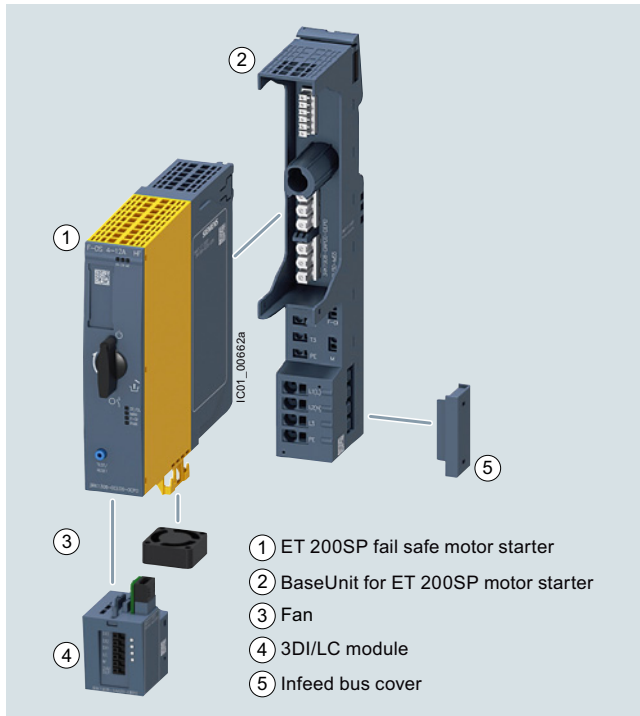
The safety application is programmed in the SIMATIC S7 F-CPU with Distributed Safety / S7 F/FH Systems / Safety Advanced. The fail-safe input signals of the ASIsafe slave modules are read via the AS-i bus line and are combined with any chosen further signals in the fail-safe program.

The fail-safe output signals can be output via safe SIMATIC output modules or also directly via AS-i – with the help of safe AS-i output modules, e.g. SlimLine S45F safety modules, article number 3RK1405-1SE15-0AA2 (see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10011823?tree=CatalogTree>). No special functions are required for this in the program.

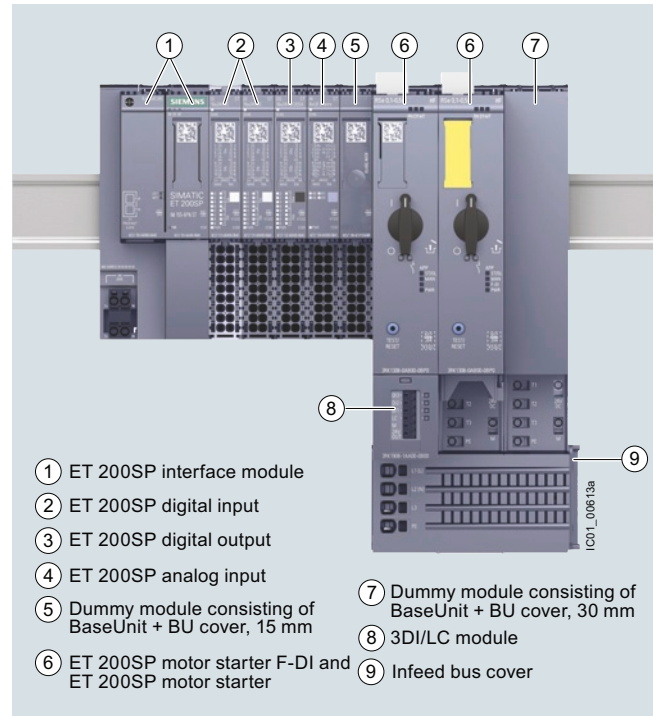
Operation with SINUMERIK 840D sl is possible with SINUMERIK software version V4.7 SP2 HF1 or higher.

Together with an ET 200SP F-CPU 1510SP F / 1512SP F (firmware V1.8 and higher) or 1515SP PC F, pre-processing of safe AS-i signals directly in the ET 200SP station is possible, as well as the configuration of an autonomous AS-i Safety station without a higher-level CPU.

Overview



Motor starter, BaseUnit, fan and 3DI/LC control module



3RK1308 motor starter in the ET 200SP I/O system

More information

Homepage, see www.siemens.com/ET200SP-motorstarter
Industry Mall, see www.siemens.com/product?3RK1308
TIA Selection Tool, see www.siemens.com/TST

Further components in the ET 200SP distributed I/O system, see Industry Mall, www.siemens.com/product?ET200SP

ET 200SP motor starters

ET 200SP is a scalable and extremely flexible modular I/O system with IP20 degree of protection.

As I/O modules, the ET 200SP motor starters are an integral part of this I/O system. They are switching and protection devices for single- and three-phase loads and are available as direct-on-line or reversing starters.

Basic functionality

All versions of the ET 200SP motor starter feature the following functionality:

- Fully pre-wired motor starters for switching and protecting any AC loads up to 5.5 kW from 48 V AC to 500 V AC
- Disconnection possible via fail-safe motor starters up to SIL 3 and PL e Cat. 4
- With self-assembling 32 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
- Digital inputs can optionally be used via a 3DI/LC module
- Control of the motor starter from the control system and extensive 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 the motor starter, and system faults.

Use of fan

For motor starters with a 12 A rated current, the 3RW4928-8VB00 fan is included in the scope of supply.

This fan can also be ordered as an option for motor starters with lower rated currents, if the boundary conditions demand this. For information on the ambient conditions for the use of motor starters, see chapter "Product overview" in the manual.

Designing interference-free motor starters

For interference-free operation of the ET 200SP station in accordance with IEC 60947-4-2 standard, use a dummy module before the first motor starter. The dummy module consists of the 6ES7193-6BP00-0BA0 or 6ES7193-6BP00-0DA0 BaseUnit and the 6ES7133-6CV15-1AM0 BU cover 15 mm.

The 15 mm BU cover protects the plug contacts of the BaseUnit against dirt.

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > ET 200SP motor starters

Electromechanical switching devices in series with hybrid motor starters

Switching an inductive load - in particular of motors <1 kW with high inductance - with an electromechanical switching device (e.g. contactor) can cause high and steep voltage edges.

The resulting faults/damage can be prevented by first disconnecting with the hybrid motor starter or by using EMC suppression modules:

- For 3RT2916-1P.. EMC suppression modules for direct mounting on the contactor, see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10047575>
- For motor suppression modules that are fitted in the main circuit, see page 9/186

Note:

For more information, see <https://support.industry.siemens.com/cs/ww/en/view/109758696>.

BaseUnits for motor starters

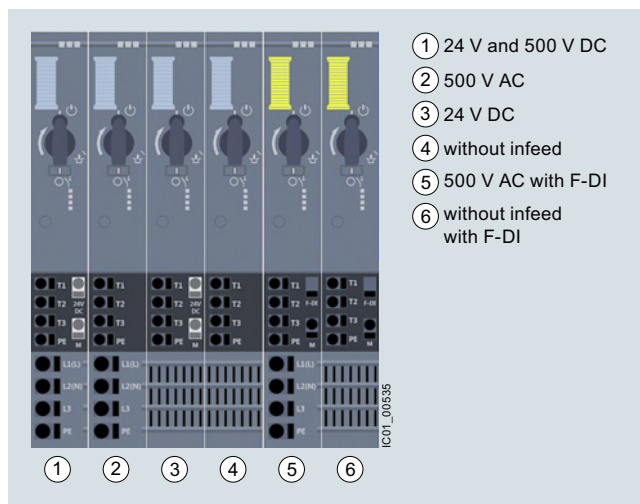
BaseUnits are components for accommodating the ET 200SP I/O modules.

The self-assembling voltage buses integrated into the terminal modules reduce wiring outlay to the single infeed (both of auxiliary and load voltage).

All modules following on the right are automatically supplied upon plugging the BaseUnits together, if BaseUnits are inserted with routing.

The rugged design and keyed connection technology enables use in harsh industrial conditions.

The BaseUnits are available with various infeeds for the motor starters.



View of the BaseUnit infeeds for the motor starters

3DI/LC control module

This is a digital input module with three inputs for local motor starter functions such as "manual local control", "implementation of fast inputs" or "end position disconnection". For a list of all the functions permitted by the 3DI/LC module, see chapter "Overview of functions" in the manual.

The module is plugged into the front of the motor starter from which it is supplied with a 24 V DC operating voltage.

Article No. scheme

Product versions		Article number	
Motor starters		3RK1308 - 0 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 0 - 0 C P 0	
Product function	Direct-on-line starter	A	for motor standard output 0.12 ... 5.5 kW ¹⁾
	Reversing starters	B	for motor standard output 0.12 ... 5.5 kW ¹⁾
	Fail-safe direct-on-line starters	C	for motor standard output 0.12 ... 5.5 kW ¹⁾
	Fail-safe reversing starters	D	for motor standard output 0.12 ... 5.5 kW ¹⁾
Current range	0.3 ... 1 A	B	maximum current-carrying capacity when starting 10 A maximum current-carrying capacity when starting 30 A maximum current-carrying capacity when starting 90 A including fan (3RW4928-8VB00), maximum current-carrying capacity when starting 100 A
	0.9 ... 3 A	C	
	2.8 ... 9 A	D	
	4 ... 12 A	E	
Example		3RK1308 - 0 A D 0 0 - 0 C P 0	

¹⁾ For standard motors: Single- or three-phase asynchronous motors, single-phase AC motors, single-phase asynchronous motors, at 400 V AC and 500 V AC; the actual startup characteristics of the motor as well as its rated data are important factors here.

Product versions		Article number		
BaseUnit		3RK1908 - 0 A P 0 0 - 0 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> P 0		
BU infeed	24 V DC and 500 V AC	A		
	24 V DC	B		
	500 V AC	C		
	without infeed	D		
	500 V AC	E		with F-DI for fail-safe motor starters
	without infeed	F		with F-DI for fail-safe motor starters
Example		3RK1908 - 0 A P 0 0 - 0 A P 0		

Note:

The article number schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits**Product advantages**

The ET 200SP motor starters offer a number of advantages:

- Fully integrated into the ET 200SP I/O system (including TIA Selection Tool and TIA Portal)
- High degree of flexibility when it comes to safety applications via SIMATIC F-CPU or 3SK safety relays up to SIL 3 and PL e Cat. 4.
- Simple, integrated current value transmission
- Extensive parameterization by means of TIA Portal
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Greater endurance and reduced heat losses thanks to hybrid technology
- Less space required in the control cabinet (20 to 80%) as a result of greater functional density (direct-on-line and reversing starters in same width)
- Extensive diagnostics and information for preventive maintenance
- Parameterizable inputs via 3DI/LC control module
- Less wiring and testing required as a result of integrating several functions into a single device
- Lower overheads for stock keeping and configuration as a result of the wide setting range of the electronic overload release (up to 1:3)
- Technology has lower inherent power losses than speed-controlled drive systems, so that less cooling (and smaller footprint) are possible (and enabling a more compact design)
- The ET 200SP motor starters can be used with highly energy-efficient IE3/IE4 motors, [see Application Manual](#). Take the current characteristics of the connected motor and motor starter into account when dimensioning. In addition to the rated current, the maximum permissible current range of the motor starter and the ratio of the rated current to the starting current of the motor are relevant. For more information on IE3/IE4, [see www.siemens.com/IE3ready](#).

Standards and approvals

- IEC/EN 60947-4-2
- UL 60947-4-2
- CSA
- ATEX
- IEC 61508-1: SIL 3
- ISO 13849: PL e
- CCC approval for China

Application

The ET 200SP motor starters are suitable for the following applications:

- Switching and monitoring of
 - three-phase motors with overload and short-circuit protection (e.g. 400 V asynchronous motors for secondary drives in conveyor systems)
 - single-phase motors with overload and short-circuit protection (e.g. 230 V motors for pump applications)
 - resistive loads by means of current value and diagnosis via the maintenance function (e.g. for heaters)
- Plant monitoring and energy management in conveyor systems:
 - By means of the phase asymmetry and zero current detection during current measurement, for example, drive belt monitoring and blocking monitoring are possible.
- Track switching and lifting table control in conveyor systems:
 - Track switches can be implemented using the quick stop function and lifting table controls by means of the "immediate end position disconnection" function without any laborious programming.
- Safe isolation of the drive from main power supply:
 - The isolating functions according to IEC 60947-1 offer protection against inadvertent activation during plant maintenance.

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > ET 200SP motor starters

Technical specifications

More information

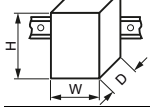
Industry Mall, see www.siemens.com/product?3RK1308

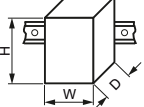
Manual, see

<https://support.industry.siemens.com/cs/ww/en/view/109479973>

FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/21800/faq>

ET 200SP motor starters

Article number		3RK1308-0AB00-0CP0	3RK1308-0AC00-0CP0	3RK1308-0AD00-0CP0	3RK1308-0AE00-0CP0
		3RK1308-0BB00-0CP0	3RK1308-0BC00-0CP0	3RK1308-0BD00-0CP0	3RK1308-0BE00-0CP0
Product designation		Motor starters			
General technical specifications:					
Width x height x depth	mm	30 × 142 × 150			
					
Design of the switch contact		Hybrid			
Design of the motor protection		Electronic			
Installation altitude at height above sea level, maximum	m	4 000			
Mounting position		Vertical, horizontal, flat (observe derating)			
Type of mounting		Can be plugged into BaseUnit			
Ambient temperature	°C	-25 ... +60			
• During operation	°C	-40 ... +70			
• During transport	°C	-40 ... +70			
• During storage					
Relative humidity during operation	%	10 ... 95			
Vibration resistance		15 mm up to 6 Hz; 2 g up to 500 Hz			
Shock resistance		6 g / 11 ms			
Degree of protection		IP20			
Type of coordination		1			
Electrical data:					
Supply voltage at DC rated value	V	24			
Operational power for AC-53a at 400 V rated value	kW	0.25	1.1	4	5.5
Operating frequency, rated value	Hz	50 ... 60			
Ultimate short-circuit current breaking capacity (I_{cu})	kA	55			
• at 400 V rated value	kA	55			
• at 500 V rated value					
Adjustable current response value of the inverse-time delayed overload release	A	0.3 ... 1	0.9 ... 3	2.8 ... 9	4 ... 12
Max. current carrying capacity at startup	A	10	30	90	100
Max. permissible voltage for protective separation between main and auxiliary circuit	V	500			
Insulation voltage, rated value	V	500			
Trip class		CLASS 5 and 10 adjustable			

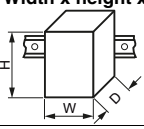
Article number		3RK1308-0CB00-0CP0	3RK1308-0CC00-0CP0	3RK1308-0CD00-0CP0	3RK1308-0CE00-0CP0
		3RK1308-0DB00-0CP0	3RK1308-0DC00-0CP0	3RK1308-0DD00-0CP0	3RK1308-0DE00-0CP0
Product designation		Fail-safe motor starter			
General technical specifications:					
Width x height x depth	mm	30 × 142 × 150			
					
Design of the switch contact		Hybrid			
Design of the motor protection		Electronic			
Installation altitude at height above sea level, maximum	m	2 000			
Mounting position		Vertical, horizontal, flat (observe derating)			
Type of mounting		Can be plugged into BaseUnit			
Ambient temperature					
• During operation	°C	-25 ... +60			
• During transport	°C	-40 ... +70			
• During storage	°C	-40 ... +70			
Relative humidity during operation	%	10 ... 95			
Vibration resistance		15 mm up to 6 Hz; 2 g up to 500 Hz			
Shock resistance		6 g / 11 ms			
Degree of protection		IP20			
Type of coordination		1			
Electrical data:					
Supply voltage at DC rated value	V	24			
Operational power for AC-53a at 400 V rated value	kW	0.25	1.1	4	5.5
Operating frequency, rated value	Hz	50 ... 60			
Ultimate short-circuit current breaking capacity (I_{cu})					
• at 400 V rated value	kA	55			
• at 500 V rated value	kA	55			
Adjustable current response value of the inverse-time delayed overload release	A	0.3 ... 1	0.9 ... 3	2.8 ... 9	4 ... 12
Max. current carrying capacity at startup	A	10	30	90	100
Max. permissible voltage for protective separation between main and auxiliary circuit	V	500			
Insulation voltage, rated value	V	500			
Trip class		CLASS 5 and 10 adjustable			

I/O Systems

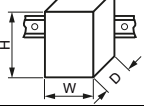
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > ET 200SP motor starters

BaseUnits for motor starters

Article number	3RK1908-0AP00-0AP0	3RK1908-0AP00-0BP0	3RK1908-0AP00-0CP0	3RK1908-0AP00-0DP0	3RK1908-0AP00-0EP0	3RK1908-0AP00-0FP0
Product designation	BaseUnit					
General technical specifications:						
Width x height x depth	mm	30 × 215 × 75				
						
Ambient temperature						
• During operation	°C	-25 ... +60				
• During transport	°C	-40 ... +70				
• During storage	°C	-40 ... +70				
Degree of protection		IP20				
Touch protection against electric shock		Finger-safe				
Connections/terminals:						
Type of connectable conductor cross-sections						
• at the inputs for supply voltage						
- Solid		1 x 0.5 ... 2.5 mm ² --				
- Finely stranded with end sleeve		1 x 0.5 ... 2.5 mm ² --				
- Finely stranded without end sleeve		1 x 0.5 ... 2.5 mm ² --				
- Solid for AWG cables		1 x 20 ... 12 --				
• For infeed						
- Solid		1 x 1 ... 6 mm ²	--	1 x 1 ... 6 mm ²	--	1 x 1 ... 6 mm ² --
- Finely stranded with end sleeve		1 x 1 ... 6 mm ²	--	1 x 1 ... 6 mm ²	--	1 x 1 ... 6 mm ² --
- Finely stranded without end sleeve		1 x 1 ... 6 mm ²	--	1 x 1 ... 6 mm ²	--	1 x 1 ... 6 mm ² --
- Solid for AWG cables		1 x 18 ... 10	--	1 x 18 ... 10	--	1 x 18 ... 10 --
• For load-side outgoing feeder						
- Solid		1 x 0.5 ... 2.5 mm ²				
- Finely stranded with end sleeve		1 x 0.5 ... 2.5 mm ²				
- Finely stranded without end sleeve		1 x 0.5 ... 2.5 mm ²				
- Solid for AWG cables		1 x 20 ... 12				
Type of electrical connection for auxiliary and control circuits		Spring-type terminals (push-in)				
Miscellaneous:						
Type of screwdriver tip		Slotted				
Size of screwdriver tip		Standard screwdriver 0.6 mm x 3.5 mm				

3DI/LC control module

Article number	3RK1908-1AA00-0BP0	
Product designation	3DI/LC control module	
General technical specifications:		
Width x height x depth	mm	30 × 54.5 × 42.3
		
Type of product	Accessories	
Number of digital inputs	4	
Installation altitude at height above sea level, maximum	m	2 000
Mounting position	Vertical, horizontal, flat	
Type of mounting	Can be plugged onto motor starter	
Ambient temperature	°C	-25 ... +60
• During operation	°C	-40 ... +70
• During transport	°C	-40 ... +70
• During storage	°C	-40 ... +70
Connections/terminals:		
Connectable conductor cross-section for auxiliary contacts	mm ²	0.2 ... 1.5
• Solid or stranded	mm ²	0.25 ... 1.5
• Finely stranded with end sleeve	mm ²	0.2 ... 1.5
• Finely stranded without end sleeve	mm ²	0.2 ... 1.5
AWG number as coded connectable conductor cross-section for auxiliary contacts	24 ... 16	
Type of electrical connection for auxiliary and control circuits	Spring-type terminals (push-in)	
Electrical data:		
Type of voltage of the control supply voltage	DC	
Control supply voltage at DC rated value	V	20.4 ... 28.8
Miscellaneous:		
Type of screwdriver tip	Slotted	
Size of screwdriver tip	Standard screwdriver 0.6 mm x 3.5 mm	

I/O SystemsSIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SPI/O modules > ET 200SP motor starters **IE3/IE4 ready****Selection and ordering data**Adjustable current response
value of the inverse-time
delayed overload releaseMax. current carrying
capacity at startup

Article No.

A

A

Motor starters**Direct-on-line starters**

0.3 ... 1	10
0.9 ... 3	30
2.8 ... 9	90
4 ... 12	100

3RK1308-0AB00-0CP0
3RK1308-0AC00-0CP0
3RK1308-0AD00-0CP0
3RK1308-0AE00-0CP0

3RK1308-0AB00-0CP0

Reversing starters

0.3 ... 1	10
0.9 ... 3	30
2.8 ... 9	90
4 ... 12	100

3RK1308-0BB00-0CP0
3RK1308-0BC00-0CP0
3RK1308-0BD00-0CP0
3RK1308-0BE00-0CP0

3RK1308-0BB00-0CP0

Fail-safe motor starters**Fail-safe direct-on-line starters**

0.3 ... 1	10
0.9 ... 3	30
2.8 ... 9	90
4 ... 12	100

3RK1308-0CB00-0CP0
3RK1308-0CC00-0CP0
3RK1308-0CD00-0CP0
3RK1308-0CE00-0CP0


3RK1308-0CE00-0CP0

Fail-safe reversing starters

0.3 ... 1	10
0.9 ... 3	30
2.8 ... 9	90
4 ... 12	100

3RK1308-0DB00-0CP0
3RK1308-0DC00-0CP0
3RK1308-0DD00-0CP0
3RK1308-0DE00-0CP0

3RK1308-0DE00-0CP0

Type of product	Operational voltage of the AC infeed	Supply voltage of the DC infeed	Push-in terminals 
	V	V	Article No.

BaseUnits¹⁾




3RK1908-0AP00-0AP0

For motor starters

with AC/DC infeed	500	24	3RK1908-0AP00-0AP0
with DC infeed	--	24	3RK1908-0AP00-0BP0
with AC infeed	500	--	3RK1908-0AP00-0CP0
without infeed	--	--	3RK1908-0AP00-0DP0
with AC infeed, with F-DI for fail-safe motor starters	500	--	3RK1908-0AP00-0EP0
without AC infeed, with F-DI for fail-safe motor starters	--	--	3RK1908-0AP00-0FP0

¹⁾ The voltage is looped-through from BaseUnits with infeed to subsequent BaseUnits.

Type of product	Supply voltage at DC rated value	Loop through the potential group from the left	Push-in terminals 
	V		Article No.


BaseUnits



6ES7193-6BP00-0BA0

For dummy modules

dark, looping through the potential group	24	Yes	6ES7193-6BP00-0BA0
light, opening a new potential group	24	No	6ES7193-6BP00-0DA0

Control supply voltage at DC rated value	Product function		Push-in terminals 
	Local control	Digital inputs parameterizable	Article No.
V			

3DI/LC control module



3RK1908-1AA00-0BP0

20.4 ... 28.8	Yes	Yes	3RK1908-1AA00-0BP0
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I/O SystemsSIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP**I/O modules > ET 200SP motor starters**

	Product designation	Type of product	Article No.
Accessories			
	BU cover 15 mm	for BaseUnits Type A0 or A1	6ES7133-6CV15-1AM0
6ES7133-6CV15-1AM0			
	BU cover 30 mm	For protection of empty slots, 30 mm	3RK1908-1CA00-0BP0
3RK1908-1CA00-0BP0			
	Infeed bus cover (1 bag containing 10 covers)	For ET 200SP	3RK1908-1DA00-2BP0
3RK1908-1DA00-2BP0			
	Mechanical bracket (1 bag containing 5 mechanical brackets)	Mechanical, for ET 200SP	3RK1908-1EA00-1BP0
3RK1908-1EA00-1BP0			
	Fan	Can be used for 3RK1308	3RW4928-8VB00
3RW4928-8VB00			
	Motor suppression module <i>NEW</i> • Square		3RK1911-6EA00
3RK1911-6EA00			
	• Round		3RK1911-6EB00
3RK1911-6EB00			

Overview

- For pneumatic control of actuators with ET 200SP
- Can be used together with system and IO components of the ET 200SP distributed I/O system.
- Product of the product partners Bürkert Fluid Control Systems, and can only be obtained from Bürkert Fluid Control Systems.

Note:

Product partners are external companies outside Siemens AG and its associated companies. Information and descriptions of products made by product partners are non-binding, and are the responsibility of the product partners. These products are manufactured independently and under the responsibility of the particular product partner, and are sold and supplied by it under its terms of business and delivery.

Unless compulsory by law, Siemens assumes no liability and makes no guarantee for for these products or for the connection with these products of the product partners. Please refer also to the note on exemption from liability/use of hyperlinks.

Benefits

- High process safety by using non-return valves and pneumatic infeed modules with pressure monitoring.
- System-wide detailed diagnostics in plain text, and also locally on an LC display
- Quick and easy valve change during operation (hot swapping)
- Reduced number of components in the control cabinet (compact control cabinet is possible)
- Quick installation & configuration of the pneumatic connections

Application

Valve terminals are widely used in industrial automation, and serve as pilot valves for controlling actuators in the food, pharmaceutical and water treatment industries. In combination with the AirLINE SP, type 8647 from the Bürkert Co., the ET 200SP forms a universal interface between process and plant control, and enables the flexible, modular structure of pilot valves and I/O modules. The valve terminal can also be attached to a control cabinet floor with an AirLINE Quick Adapter, which further reduces the space required in the control cabinet, and significantly simplifies the pneumatic installation.

More information

For more detailed information about the AirLINE SP, type 8647 (e.g. data sheet, operating manual) please contact Bürkert directly:

<http://www.burkert.com/en/type/8647>

Disclaimer of liability

This information and the descriptions have been compiled with great care. However, it is not possible for Siemens to verify that the data supplied by product partners is complete, correct and up-to-date. The possibility that individual items of information might be incorrect, incomplete, or not up-to-date cannot therefore be ruled out. Unless compulsory by law, Siemens accepts no liability for the usability of the data or of the products for the user per se.

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Power supplies > Single-phase, 24 V DC (for SIMATIC ET 200SP)

Overview



In terms of design and functionality, the SIMATIC ET 200SP PS single-phase load power supply with automatic range switching of the input voltage is perfectly matched to the SIMATIC ET 200SP. The SIMATIC component and the power supply are wired by means of uniform push-in terminal technology. The 24 V supply provides power to the ET 200SP system components such as the interface module, technology module and communication module, as well as the digital or analog inputs/ outputs. Comprehensive certifications, such as UL or GL, facilitate universal use. Its extremely flat design also makes this power supply ideally suited for installation in compact on-site control boxes.

Technical specifications

Article number	6EP7133-6AB00-0BNO	6EP7133-6AE00-0BNO
Product	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
Power supply, type	24 V/5 A	24 V/10 A
Input		
Input	1-phase AC	1-phase AC
• Note	Automatic range selection	Automatic range selection
Supply voltage		
• 1 at AC Rated value	120 V	120 V
• 2 at AC Rated value	230 V	230 V
Input voltage		
• 1 at AC	85 ... 132 V	85 ... 132 V
• 2 at AC	170 ... 264 V	170 ... 264 V
Wide-range input	No	No
Overvoltage resistance	$2.3 \times V_{in \text{ rated}}, 1.3 \text{ ms}$	$2.3 \times V_{in \text{ rated}}, 1.3 \text{ ms}$
Mains buffering at $I_{out \text{ rated}}, \text{min.}$	20 ms; at $V_{in} = 93/187 \text{ V}$	20 ms; at $V_{in} = 93/187 \text{ V}$
Rated line frequency 1	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz
Input current		
• at rated input voltage 120 V	2.16 A	4.34 A
• at rated input voltage 230 V	1.22 A	1.92 A
Switch-on current limiting (+25 °C), max.	45 A	60 A
$I^2t, \text{max.}$	3.15 A ² ·s	6.3 A ² ·s
Built-in incoming fuse	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	recommended LS switch: B/C 6 A/3 A	recommended LS switch: B/C 10 A/6 A

Technical specifications (continued)

Article number	6EP7133-6AB00-0BNO	6EP7133-6AE00-0BNO
Product	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
Power supply, type	24 V/5 A	24 V/10 A
Output		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage V_{out} DC	24 V	24 V
Total tolerance, static \pm	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	1 %	1 %
Residual ripple peak-peak, max.	150 mV	150 mV
Residual ripple peak-peak, typ.	50 mV	50 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	240 mV	240 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	150 mV	150 mV
Adjustment range	22.8 ... 28 V	22.8 ... 28 V
Product function Output voltage adjustable	Yes	Yes
Output voltage setting	via potentiometer	via potentiometer
Status display	Green LED for 24 V OK	Green LED for 24 V OK
Signaling	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for "24 V OK"	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for "24 V OK"
On/off behavior	Overshoot of $V_{out} < 3 \%$	Overshoot of $V_{out} < 3 \%$
Startup delay, max.	0.3 s	0.3 s
Voltage rise, typ.	30 ms	30 ms
Rated current value $I_{out rated}$	5 A	10 A
Current range	0 ... 6 A	0 ... 12 A
• Note	5 A up to +60°C; +60 ... +70 °C: Derating 3%/K	10 A up to +60°C; +60 ... +70 °C: Derating 3%/K
Supplied active power typical	120 W	240 W
Short-term overload current		
• on short-circuiting during the start-up typical	15 A	30 A
• at short-circuit during operation typical	15 A	30 A
Duration of overloading capability for excess current		
• on short-circuiting during the start-up	800 ms	750 ms
• at short-circuit during operation	800 ms	800 ms
Parallel switching for enhanced performance	Yes	Yes
Numbers of parallel switchable units for enhanced performance	2	2
Efficiency		
Efficiency at $V_{out rated}$, $I_{out rated}$, approx.	88 %	90 %
Power loss at $V_{out rated}$, $I_{out rated}$, approx.	17 W	26 W
Power loss [W] during no-load operation maximum	2.7 W	2.8 W
Closed-loop control		
Dynamic mains compensation ($V_{in rated} \pm 15 \%$), max.	0.3 %	0.3 %
Dynamic load smoothing (I_{out} : 10/90/10 %), $U_{out} \pm$ typ.	3 %	3 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms

I/O SystemsSIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP**Power supplies > Single-phase, 24 V DC (for SIMATIC ET 200SP)****Technical specifications (continued)**

Article number	6EP7133-6AB00-0BNO	6EP7133-6AE00-0BNO
Product	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
Power supply, type	24 V/5 A	24 V/10 A
Protection and monitoring		
Output overvoltage protection	protection against overvoltage in case of internal fault $V_{out} < 31.8 \text{ V}$	protection against overvoltage in case of internal fault $V_{out} < 31.8 \text{ V}$
Current limitation	7 ... 7.5 A	14 ... 15 A
Property of the output	Yes	Yes
Short-circuit proof		
Short-circuit protection	Constant current characteristic	Constant current characteristic
Enduring short circuit current RMS value		
• typical	7 A	14.1 A
Overcurrent overload capability in normal operation	overload capability 150 % I_{out} rated up to 5 s/min	overload capability 150 % I_{out} rated up to 5 s/min
Overload/short-circuit indicator	-	-
Safety		
Primary/secondary isolation (galvanic isolation)	Yes Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178	Yes Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178
Protection class	Class I	Class I
Leakage current		
• maximum	3.5 mA	3.5 mA
• typical	1 mA	1 mA
CE mark	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL61010-2-201, CSA C22.2 No.142), cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	cULus-Listed (UL61010-2-201, CSA C22.2 No.142), cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)
CB approval	Yes	Yes
Marine approval	BV, DNV GL	BV, DNV GL
Degree of protection (EN 60529)	IP20	IP20
EMC		
Emitted interference	EN 61000-6-3 Class B	EN 61000-6-3 Class B
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2
Operating data		
Ambient temperature		
• during operation	-30 ... +70 °C	-30 ... +70 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation
Mechanics		
Connection technology	Push-in terminals	Push-in terminals
Connections		
• Supply input	L, N, PE: 1 push-in terminal each for 0.2 ... 2.5 mm ² single-core/finely stranded	L, N, PE: 1 push-in terminal each for 0.2 ... 2.5 mm ² single-core/finely stranded
• Output	+, -: 2 push-in terminals each for 0.2 ... 2.5 mm ²	+, -: 2 push-in terminals each for 0.2 ... 2.5 mm ²
• Auxiliary	Signaling contact: 2 push-in terminals for 0.2 ... 2.5 mm ²	Signaling contact: 2 push-in terminals for 0.2 ... 2.5 mm ²
Connections signaling contact	2 push-in terminals for 0.2 ... 2.5 mm ²	2 push-in terminals for 0.2 ... 2.5 mm ²
Product function		
• removable terminal at input	Yes	Yes
• removable terminal at output	Yes	Yes

Technical specifications (continued)

	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
Article number	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
Product	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
Power supply, type	24 V/5 A	24 V/10 A
Width of the enclosure	160 mm	160 mm
Height of the enclosure	117 mm	117 mm
Depth of the enclosure	74 mm	74 mm
Required spacing		
• top	50 mm	50 mm
• bottom	50 mm	50 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
Weight, approx.	0.5 kg	0.7 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Electrical accessories	Redundancy module, buffer module, selectivity module, DC UPS	Redundancy module, buffer module, selectivity module, DC UPS
MTBF at 40 °C	1 598 441 h	1 114 510 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

SIMATIC ET 200SP PS
Stabilized power supply for
SIMATIC ET 200SP
Input: 120/230 V AC
Output: 24 V DC/5 A

Article No.**6EP7133-6AB00-0BN0****Article No.**

SIMATIC ET 200SP PS
Stabilized power supply for
SIMATIC ET 200SP
Input: 120/230 V AC
Output: 24 V DC/10 A

6EP7133-6AE00-0BN0

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

BaseUnits

Overview



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

- No tools needed for one-handed wiring using push-in terminals
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm
- 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 (gaps without 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 EMC interference immunity:
 - 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 and EMC loads
- Optional module-specific color identification of the terminals according to the color code CC
- Optional equipment marking using slide-in equipment labeling plates

An ET 200SP station can be expanded via one 'BU-Send' BaseUnit with a "BA-Send" BusAdapter plugged onto it with up to 16 modules from the ET 200AL series of I/O devices with IP67 protection.

Technical specifications

Article number	6ES7193-6BP20-0DA0	6ES7193-6BP00-0DA0	6ES7193-6BP60-0DA0	6ES7193-6BP20-0BA0	6ES7193-6BP00-0BA0	6ES7193-6BP60-0BA0
	BaseUnit Type A0, BU15-P16+A10+2D	BaseUnit Type A0, BU15-P16+A0+2D	2x BU Type A0, 2BU15-P16+A0+2DB, PU 1	BaseUnit Type A0, BU15-P16+A10+2B	BaseUnit Type A0, BU15-P16+A0+2B	2x BU Type A0, 2BU15-P16+A0+2B, PU 1
General information						
Product type designation	BU type A0	BU type A0	BU type A0	BU type A0	BU type A0	BU type A0
Ambient conditions						
Ambient temperature during operation						
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level						
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Connection method						
Terminals						
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26
• Conductor cross-section, max.	2.5 mm ² ; AWG 14	2.5 mm ² ; AWG 14	2.5 mm ² ; AWG 14	2.5 mm ² ; AWG 14	2.5 mm ² ; AWG 14	2.5 mm ² ; AWG 14
• Number of process terminals to I/O module	16	16	16; Pro slot	16	16; Pro slot	16; Pro slot
• Number of terminals to AUX bus	10	0	0	10	0	0
• Number of add-on terminals	0	0	0	0	0	0
• Number of terminals with connection to P1 and P2 bus	2	2	2; Pro slot	2	2; Pro slot	2; Pro slot
Dimensions						
Width	15 mm	15 mm	30 mm	15 mm	15 mm	30 mm
Height	141 mm	117 mm	117 mm	141 mm	117 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm	35 mm	35 mm
Weights						
Weight, approx.	50 g	40 g	80 g	50 g	40 g	80 g
Article number	6ES7193-6BP20-0BB0	6ES7193-6BP20-0BB1	6ES7193-6BP20-0DC0	6ES7193-6BP20-0BC1	6ES7193-6BP00-0BD0	6ES7193-6BP20-0BF0
	BaseUnit Type B0, BU20-P12+A4+0B	BaseUnit Type B1, BU20-P12+A0+4B, PU 1	BaseUnit Type C0, BU20-P6+A2+4D	BaseUnit Type C1, BU20-P6+A2+4B	BaseUnit Type D0, BU20-P12+A0+0B	BaseUnit Type F0, BU20-P8+A4+0B
General information						
Product type designation	BU type B0	BU type B1	BU type C0	BU type C1	BU type D0	BU type F0
Dimensions						
Width	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Height	117 mm	117 mm	117 mm	117 mm	117 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm	35 mm	35 mm
Weights						
Weight, approx.	48 g	48 g	47 g	47 g	47 g	48 g

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

BaseUnits

Technical specifications (continued)

Article number	6ES7193-6BP40-0DA1 BaseUnit Type A1, BU15-P16+A0+12D/T	6ES7193-6BP00-0DA1 BaseUnit Type A1, BU15-P16+A0+2D/T	6ES7193-6BP40-0BA1 BaseUnit Type A1, BU15-P16+A0+12B/T	6ES7193-6BP00-0BA1 BaseUnit Type A1, BU15-P16+A0+2B/T
General information				
Product type designation	BU type A1	BU type A1	BU type A1	BU type A1
Connection method				
Terminals				
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26
• Conductor cross-section, max.	2.5 mm ² ; AWG 14	2.5 mm ² ; AWG 14	2.5 mm ² ; AWG 14	2.5 mm ² ; AWG 14
• Number of process terminals to I/O module	16	16	16	16
• Number of terminals to AUX bus	0	0	0	0
• Number of add-on terminals	0	0	0	0
• Number of terminals with connection to P1 and P2 bus	2	2	2	2
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	141 mm	117 mm	141 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm
Weights				
Weight, approx.	50 g	40 g	50 g	40 g

Article number	6ES7193-6BP00-0DU0 BaseUnit Type U0, BU20-P16+A0+2D, PU 1	6ES7193-6BP00-0BU0 BaseUnit Type U0, BU20-P16+A0+2B, PU 1
General information		
Product type designation	BU type U0	BU type U0
Connection method		
Terminals		
• Terminal type	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm ² ; 0.2 mm ² without wire end ferrule	0.14 mm ² ; 0.2 mm ² without wire end ferrule
• Conductor cross-section, max.	2.5 mm ² ; 1.5 mm ² with wire end ferrule	2.5 mm ² ; 1.5 mm ² with wire end ferrule
• Number of process terminals to I/O module	16	16
• Number of terminals to AUX bus	0	0
• Number of add-on terminals	0	0
• Number of terminals with connection to P1 and P2 bus	2	2
Dimensions		
Width	20 mm	20 mm
Height	117 mm	117 mm
Depth	35 mm	35 mm
Weights		
Weight, approx.	50 g	50 g

Article number	6ES7193-6BN00-0NE0 ET 200SP, BaseUnit BU-Send
Dimensions	
Width	20 mm
Height	117 mm
Depth	35 mm
Weights	
Weight, approx.	30 g

Ordering data	Article No.	Ordering data	Article No.
Type A0 BaseUnits BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in 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) <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	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	6ES7193-6BP20-0DC0
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	Type C1 BaseUnits BU20-P6+A2+4B BU type C1; BaseUnit (dark) with 6 push-in terminals (1 ... 6) to the module and an additional 2 AUX terminals; bridged to the left	6ES7193-6BP20-0BC1
2BU15-P16+A0+2DB Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) <ul style="list-style-type: none"> • 1 unit 	6ES7193-6BP60-0DA0	Type D0 BaseUnits 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+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0	Type A1 BaseUnits (with temperature detection) BU15-P16+A0+12D/T BU type A1; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	6ES7193-6BP40-0DA1
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in 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	BU15-P16+A0+2D/T BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6ES7193-6BP00-0DA1
2BU15-P16+A0+2B Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group <ul style="list-style-type: none"> • 1 unit 	6ES7193-6BP60-0BA0	BU15-P16+A0+12B/T BU type A1; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	6ES7193-6BP40-0BA1
Type B0 BaseUnits BU20-P12+A4+0B BU type B0; BaseUnit (dark) with 12 push-in terminals (1...12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group; 1 unit <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP20-0BB0 6ES7193-6BP20-2BB0	BU15-P16+A0+2B/T BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	6ES7193-6BP00-0BA1
Type B1 BaseUnits BU20-P12+A0+4B BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the load group; 1 unit <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP20-0BB1 6ES7193-6BP20-2BB1	Type F0 BaseUnits BU20-P8+A4+0B BU type F0; BaseUnit (dark) with 8 push-in 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
		BaseUnits type U0 BU20-P16+A0+2D BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP00-0DU0 6ES7193-6BP00-2DU0
		BU20-P16+A0+2B BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group <ul style="list-style-type: none"> • 1 unit • 10 units 	6ES7193-6BP00-0BU0 6ES7193-6BP00-2BU0

I/O Systems

SIMATIC ET 200 systems for the control cabinet
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BaseUnits

Ordering data

Ordering data	Article No.
Station expansion with IP67 I/O system ET 200AL	
BaseUnit BU-Send	6ES7193-6BN00-0NE0
ET 200SP BusAdapter BA-Send 1 x FC	6ES7193-6AS00-0AA0
Accessories	
Equipment labeling plate	6ES7193-6LF30-0AW0
10 sheets of 16 labels	
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	

Article No.

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 CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units	6ES7193-6CP01-4MA0
• Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	6ES7193-6CP02-2MA0
• Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units	6ES7193-6CP02-4MA0
• 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 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, 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

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	6ES7193-6BP00-0DA0	6ES7193-6BP20-0BA0	6ES7193-6BP20-0DA0
	SIPLUS ET 200SP BU15-P16+A0+2B	SIPLUS ET 200SP BU15-P16+A0+2D	SIPLUS ET 200SP BU15-P16+A10+2B	SIPLUS ET 200SP BU15-P16+A10+2D
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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 in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

I/O Systems

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SIPLUS BaseUnits

Technical specifications (continued)

Article number	6AG1193-6BP00-7BA0	6AG1193-6BP00-7DA0	6AG1193-6BP20-7BA0	6AG1193-6BP20-7DA0
Based on	6ES7193-6BP00-0BA0 SIPLUS ET 200SP BU15-P16+A0+2B	6ES7193-6BP00-0DA0 SIPLUS ET 200SP BU15-P16+A0+2D	6ES7193-6BP20-0BA0 SIPLUS ET 200SP BU15-P16+A10+2B	6ES7193-6BP20-0DA0 SIPLUS ET 200SP BU15-P16+A10+2D
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	6AG1193-6BP00-7BA1	6AG1193-6BP00-7DA1	6AG1193-6BP40-7BA1	6AG1193-6BP40-7DA1
Based on	6ES7193-6BP00-0BA1 SIPLUS ET 200SP BU15-P16+A0+2B/T	6ES7193-6BP00-0DA1 SIPLUS ET 200SP BU15-P16+A0+2D/T	6ES7193-6BP40-0BA1 SIPLUS ET 200SP BU15-P16+A0+12B/T	6ES7193-6BP40-0DA1 SIPLUS ET 200SP BU15-P16+A0+12D/T
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)

Technical specifications (continued)

Article number	6AG1193-6BP00-7BA1	6AG1193-6BP00-7DA1	6AG1193-6BP40-7BA1	6AG1193-6BP40-7DA1
Based on	6ES7193-6BP00-0BA1 SIPLUS ET 200SP BU15-P16+A0+2B/T	6ES7193-6BP00-0DA1 SIPLUS ET 200SP BU15-P16+A0+2D/T	6ES7193-6BP40-0BA1 SIPLUS ET 200SP BU15-P16+A0+12B/T	6ES7193-6BP40-0DA1 SIPLUS ET 200SP BU15-P16+A0+12D/T
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 in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
<ul style="list-style-type: none"> Coatings for printed circuit board assemblies acc. to EN 61086 Protection against fouling acc. to EN 60664-3 Military testing according to MIL-I-46058C, Amendment 7 Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A 	Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high availability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIPLUS BaseUnits

Technical specifications (continued)

Article number	6AG1193-6BP20-7BB0	6AG1193-6BP20-7BB1	6AG1193-6BP20-7DC0	6AG1193-6BP00-7BD0
Based on	6ES7193-6BP20-0BB0 SIPLUS ET 200SP BU20-P12+A4+0B	6ES7193-6BP20-0BB1 SIPLUS ET 200SP BU20-P12+A0+4B TYPE B1	6ES7193-6BP20-0DC0 SIPLUS ET 200SP BU20-P6+A2+4D	6ES7193-6BP00-0BD0 SIPLUS ET 200SP BU20-P12+A0+0B
General information				
Product type designation	BU type B0	BU type B1	BU type C0	BU type D0
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C		-40 °C; = Tmin	-40 °C
• vertical installation, max.	50 °C		50 °C; = Tmax	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	3 000 m	3 000 m	3 000 m	3 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 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 in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Technical specifications (continued)

Article number	6AG1193-6BP20-2BF0	6AG1193-6BP00-7BU0	6AG1193-6BP00-7DU0
Based on	6ES7193-6BP20-0BF0	6ES7193-6BP00-0BU0	6ES7193-6BP00-0DU0
SIPLUS ET 200SP BU20-P8+A4+0B	SIPLUS ET 200SP BU20-P16+A0+2B	SIPLUS ET 200SP BU20-P16+A0+2D	SIPLUS ET 200SP BU20-P16+A0+2D
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-25 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-25 °C; = Tmin		
• vertical installation, max.	50 °C; = Tmax		
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O SystemsSIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP**SIPLUS BaseUnits**

Ordering data	Article No.	Ordering data	Article No.
SIPLUS BaseUnits type A0		SIPLUS BaseUnits type B0	
BU15-P16+A10+2D (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 push-in terminals (1...16) to the module and additionally 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	6AG1193-6BP20-7DA0	BU20-P12+A4+0B (Extended temperature range and exposure to media) BU type B0; BaseUnit (dark) with 12 push-in terminals (1...12) to the module and an additional 4 internally jumpered add-on terminals (1 A to 4 A); for continuing the load group; 1 unit	6AG1193-6BP20-7BB0
BU15-P16+A0+2D (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA0	SIPLUS BaseUnits type B1	
BU15-P16+A10+2B (Extended temperature range and exposure to media) BU type A0; BaseUnit (dark) with 16 push-in 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	BU20-P12+A0+4B (Extended temperature range and exposure to media) BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the load group; 1 unit	6AG1193-6BP20-7BB1
BU15-P16+A0+2B (Extended temperature range and exposure to media) BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0	SIPLUS BaseUnits type C0	
SIPLUS BaseUnits type A1 (with temperature detection)		BU20-P6+A2+4D (Extended temperature range and exposure to media) BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new load group	6AG1193-6BP20-7DC0
BU15-P16+A0+12D/T (Extended temperature range and exposure to media) BU type A1; BaseUnit (light) with 16 push-in terminals (1...16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	6AG1193-6BP40-7DA1	SIPLUS BaseUnits type D0	
BU15-P16+A0+2D/T (Extended temperature range and exposure to media) BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA1	BU20-P12+A0+0B (Extended temperature range and exposure to media) BU type D0; BaseUnit (dark) with 12 push-in terminals, without AUX terminals, bridged to the left	6AG1193-6BP00-7BD0
BU15-P16+A0+12B/T (Extended temperature range and exposure to media) BU type A1; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	6AG1193-6BP40-7BA1	SIPLUS BaseUnits type F0	
BU15-P16+A0+2B/T (Extended temperature range and exposure to media) BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	6AG1193-6BP00-7BA1	BU20-P8+A4+0B (Extended temperature range and exposure to media) BU type F0; BaseUnit (dark) with 8 push-in terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group	6AG1193-6BP20-2BF0
		SIPLUS BaseUnits type U0	
		BU20-P16+A0+2D (Extended temperature range and exposure to media) BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	6AG1193-6BP00-7DU0
		BU20-P16+A0+2B (Extended temperature range and exposure to media) BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	6AG1193-6BP00-7BU0
		Accessories	See SIMATIC ET 200SP BaseUnits, page 9/196

Overview

SIMATIC BusAdapter BA 2xFC for direct laying of the PROFINET cable via FastConnect connection



ET 200SP BusAdapter BA-Send for expansion of an ET 200SP station with ET 200AL modules



SIMATIC BusAdapter BA LC/RJ45 for use as a system-integrated media converter from copper (RJ45) to glass fiber (LC)

For the SIMATIC ET 200SP, two types of BusAdapter (BA) are available for selection:

- ET 200SP BusAdapter "BA-Send" for expansion of an ET 200SP station with up to 16 modules from the ET 200AL I/O series with IP67 protection via an ET connection
 - SIMATIC BusAdapter for the free selection of the connection system (pluggable or direct connection) and physical PROFINET connection (copper, POF, HCS or glass fiber) to devices with a SIMATIC BusAdapter interface.
- One further advantage of the SIMATIC BusAdapter: only the adapter needs to be replaced for subsequent conversion to the rugged FastConnect technology or a fiber-optic connection, or to repair defective RJ45 sockets.

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

BusAdapters

Technical specifications

Article number	6ES7193-6AR00-0AA0 ET 200SP, Busadapter BA 2xRJ45	6ES7193-6AF00-0AA0 ET 200SP, Busadapter BA 2XFC	6ES7193-6AP00-0AA0 ET 200SP, Busadapter BA 2xSCRJ	6ES7193-6AP20-0AA0 ET 200SP, Busadapter BA SCRJ/RJ45
General information				
Product type designation	BA 2x RJ45	BA 2xFC	BA 2xSCRJ	BA SCRJ/RJ45
Interfaces				
Number of PROFINET interfaces	1	1	1; 2 ports (switch) SCRJ FO	1; 2 ports (SCRJ + RJ45)
Supports protocol for PROFINET IO				
• Number of RJ45 ports	2			1
• Number of FC (FastConnect) connections		2		
• Number of SCRJ ports	0		2	1
• Number of LC ports	0		0	0
Cable length				
- PCF			100 m	100 m
- Plastic FOC (POF)			50 m	50 m
- PCF-GI			250 m	250 m
- Cu conductors	100 m	100 m		100 m
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.			2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions				
Width	20 mm	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	69.5 mm	
Depth	59 mm	59 mm	59 mm	
Weights				
Weight, approx.	46 g	53 g	50 g	50 g

Article number	6ES7193-6AP40-0AA0 ET 200SP, Bus adapter BA SCRJ/FC	6ES7193-6AG00-0AA0 SIMATIC Busadapter BA 2XLC	6ES7193-6AG20-0AA0 SIMATIC Busadapter BA LC/RJ45	6ES7193-6AG40-0AA0 SIMATIC Bus adapter BA LC/FC
General information				
Product type designation	BA SCRJ/FC	BA 2xLC	BA LC/RJ45	BA LC/FC
Interfaces				
Number of PROFINET interfaces	1; 2 ports (SCRJ + FC)	1; 2 ports (switch) LC Multimode Glass Fibre	1; 2 ports (switch) LC / RJ45	1
Supports protocol for PROFINET IO				
• Number of RJ45 ports			1	
• Number of FC (FastConnect) connections	1			1
• Number of SCRJ ports	1	0	0	0
• Number of LC ports	0	2; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX
Cable length				
- PCF	100 m			
- Plastic FOC (POF)	50 m			
- PCF-GI	250 m			
- Cu conductors	100 m		100 m	100 m
- Multimode graded-index fiber 50/125 µm		3 km	3 km	3 km
- Multimode graded-index fiber 62.5/125 µm		3 km	3 km	3 km
Ambient conditions				
Ambient temperature during operation				
• min.		0 °C		
• max.		60 °C		
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m		2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m

Technical specifications (continued)

Article number	6ES7193-6AP40-0AA0 ET 200SP, Bus adapter BA SCRJ/FC	6ES7193-6AG00-0AA0 SIMATIC Busadapter BA 2XLC	6ES7193-6AG20-0AA0 SIMATIC Busadapter BA LC/RJ45	6ES7193-6AG40-0AA0 SIMATIC Bus adapter BA LC/FC
Dimensions				
Width	20 mm	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	69.5 mm	69.5 mm
Depth	59 mm	59 mm	59 mm	59 mm
Weights				
Weight, approx.	50 g	40 g	32 g	50 g

Article number	6ES7193-6AS00-0AA0 ET 200SP, Busadapter BA-Send BA1XFC
General information	
Product type designation	BA-Send 1xFC
Interfaces	
Supports protocol for PROFINET IO	
Cable length	
- Cu conductors	15 m; from IM firmware V3.3: between BA-send and the first ET-CONNECTION bus node and between all other bus nodes
ET-Connection	
• Number of interfaces ET connection	1
• FC (FastConnect)	Yes

Article number	6ES7193-6AS00-0AA0 ET 200SP, Busadapter BA-Send BA1XFC
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Dimensions	
Width	20 mm
Weights	
Weight, approx.	44 g

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

BA 2xRJ45 BusAdapter For IM 155-6PN ST, HF	6ES7193-6AR00-0AA0
BA 2xFC BusAdapter For IM 155-6PN ST, HF; for increased resistance to vibration and EMC loads	6ES7193-6AF00-0AA0
BA 2xSCRJ BusAdapter For IM 155-6PN HF; fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	6ES7193-6AP00-0AA0
BA SCRJ/RJ45 BusAdapter For IM 155-6PN HF; with media converter FOC-Cu; 1 x SCRJ FO connection, 1 x RJ45 connection	6ES7193-6AP20-0AA0
BA SCRJ/FC BusAdapter For IM 155-6PN HF; with media converter FOC-Cu; 1 x SCRJ FO connection, 1 x FastConnect connection	6ES7193-6AP40-0AA0
BA 2XLC BusAdapter For IM 155-6PN HF; 2 glass FO connections	6ES7193-6AG00-0AA0
BA LC/RJ45 BusAdapter For IM 155-6PN HF; with media converter glass FO - copper; 1 x LC connection, 1 x RJ45 connection	6ES7193-6AG20-0AA0
BA LC/FC BusAdapter For IM 155-6PN HF; with media converter glass FO - copper; 1 x LC connection, 1 x FastConnect connection	6ES7193-6AG40-0AA0

Station expansion with IP67 I/O system ET 200AL	
ET 200SP BA-Send 1 x FC BusAdapter	6ES7193-6AS00-0AA0
BaseUnit BU-Send	6ES7193-6BN00-0NE0
Accessories	
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIPLUS BusAdapters

Overview



ET 200SP BusAdapter (RJ45)



BA 2xFC BusAdapter

Some interface modules of the SIPLUS 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 BA 2xRJ45 BusAdapter 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 BA 2xFC BusAdapter 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 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:

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

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	6AG1193-6AR00-7AA0 6ES7193-6AR00-0AA0 SIPLUS ET 200SP BA 2XRJ45	6AG1193-6AF00-7AA0 6ES7193-6AF00-0AA0 SIPLUS ET 200SP BA 2XFC PN	6AG1193-6AP00-2AA0 6ES7193-6AP00-0AA0 SIPLUS ET 200SP BA 2XSCRJ PN	6AG1193-6AG00-2AA0 6ES7193-6AG00-0AA0 SIPLUS ET 200SP BA 2XLC
Ambient conditions				
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)
• max.	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O Systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

SIPLUS BusAdapters

Ordering data	Article No.		Article No.
SIPLUS BA 2xRJ45 BusAdapter (Extended temperature range and exposure to environmental substances) for IM 155-6PN ST, HF	6AG1193-6AR00-7AA0	SIPLUS BA 2xLC BusAdapter (Extended temperature range and exposure to environmental substances) For IM 155-6PN HF; 2 glass FO connections	6AG1193-6AG00-2AA0
SIPLUS BA 2xFC BusAdapter (Extended temperature range and exposure to environmental substances) for IM 155-6PN ST, HF; for increased resistance to vibration and EMC loads	6AG1193-6AF00-7AA0	Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0
SIPLUS BA 2xSCRJ BusAdapter (Extended temperature range and exposure to environmental substances) for IM 155-6PN HF; fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	6AG1193-6AP00-2AA0		

Overview Labeling strips

The head-end stations and I/O modules can optionally be equipped with labeling strips (13 x 31 mm) for system-specific marking. The labeling strips can be inscribed mechanically. Labeling strips are available in two versions in the colors light gray and yellow:

- 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, 180 g/sm card, perforated, for printing using a laser printer direct from TIA Portal or via print templates

Overview Equipment labeling plates



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 or plotters, or stickers can be attached to them. Advantages compared to labels that are attached directly:

- 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

The size of the labels is 14.8 x 10.5 mm (W x H)

Overview BU cover

The ET 200SP system can be operated with any number of slot gaps (BU slot without inserted I/O module). Applications for this include:

- Partial commissioning
- Prewired but unequipped options

To protect against damage, such slot gaps must be covered by a BU cover.

Within the BU cover, an equipment labeling plate for identification of the I/O module planned for this slot can be stored.

Versions:

- For BaseUnits with a width of 15 mm (pack containing 5 BU covers)
- For BaseUnits with a width of 20 mm (pack containing 5 BU covers)

Overview Shield connection

The shield connection permits the low-cost connection of cable shields. Compared to external shield supports, the system offers the following advantages:

- 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 signal lines from the voltage supply lines
- Short unshielded cable lengths
- Requires little space

Overview Color-coded labels

The I/O modules that are plugged onto the BaseUnits determine the potentials connected at the push-in terminals. The +/- 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:

- Quick installation (one label for marking 16 terminals)
- Printed terminal numbers
- Avoidance of wiring errors
- Simple detection of potentials during servicing

Overview Server module

The server module is included in the scope of supply of all head-end stations (interface module, CPU, Open Controller). It concludes the setup of an ET 200SP station.

Overview e-coding elements

The operation of selected modules requires an electronic coding element that is always included in the scope of supply of the I/O module. Apart from the mechanical coding function, this contains a re-writable memory for the redundant storage of module-specific configuration data (e.g. F target address for fail-safe modules or parameter data in the case of the IO-Link master). In this way, this data is automatically backed up during a module replacement. This saves the user from having to set addresses manually or back up data when replacing modules.

At present, there are two types of electronic coding element:

- e-coding element (Type H), which can be used in the I/O modules:
 - CM IO-Link master
 - F-CM AS-i Safety
- e-coding element (Type F), which can be used in the I/O modules:
 - F-DI 8x24VDC HF
 - F-DQ 4x24VDC/2A PM HF
 - F-PM-E 24VDC/8A PPM ST

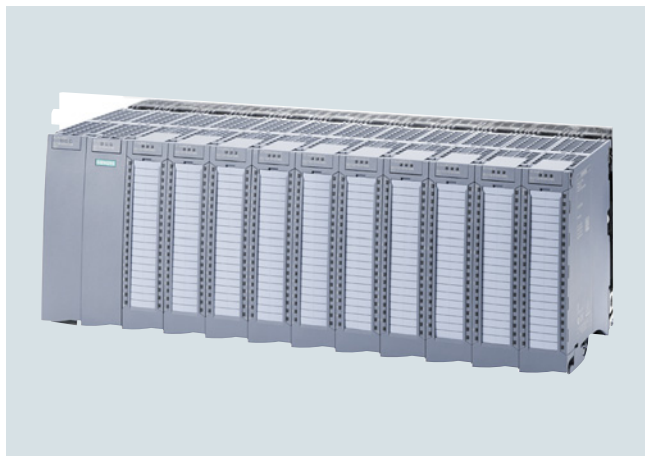
I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Accessories

Ordering data	Article No.	Article No.
Labeling strips		
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	Color code CC51, for 6 push-in terminals, for BU type C0, gray (terminals 1, 2 and 5), red (terminals 3 and 4), blue (terminal 6) (pack containing 50 labels)
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	Color code CC01, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16)
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	6ES7193-6LA10-0AA0	Color code CC02, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16)
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0	
Equipment labeling plate	6ES7193-6LF30-0AW0	Color-coded labels for additional terminals (pack containing 10 labels)
10 sheets of 16 labels		Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A)
BU cover		Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A)
For covering empty slots (gaps); 5 units	6ES7133-6CV15-1AM0	Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A)
• 15 mm wide	6ES7133-6CV20-1AM0	Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C)
• 20 mm wide		Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A)
Shield connection	6ES7193-6SC00-1AM0	Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A)
5 shield supports and 5 shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional ground		Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A)
Module-specific color-coded labels		Color code CC84, for 2 AUX terminals, BU type C0, C1, yellow/green (terminals 1 A to 2 A)
(pack containing 10 labels)		Color code CC85, for 2 AUX terminals, for BU type C0, C1, red (terminals 1 A to 2 A)
Color code CC00, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16)	6ES7193-6CP00-2MA0	Color code CC86, for 2 AUX terminals, for BU type C0, C1, blue (terminals 1 A to 2 A)
Color code CC01, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16)	6ES7193-6CP01-2MA0	Server module
Color code CC02, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16)	6ES7193-6CP02-2MA0	Spare parts
Color code CC03, for 16 push-in terminals, for BU type A0, A1 gray (terminals 1 to 8), red (terminals 9 to 12), gray (terminals 13 to 16)	6ES7193-6CP03-2MA0	e-coding element
Color code CC04, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), blue (terminals 13 to 16)	6ES7193-6CP04-2MA0	Type H; pack containing 5 e-coding elements
Color code CC05, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 12), red (terminals 13 to 14), blue (terminals 15 to 16)	6ES7193-6CP05-2MA0	Type F; pack containing 5 e-coding elements
Color code CC41, for 16 push-in terminals; for BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12)	6ES7193-6CP41-2MB0	
Color code CC42, for 12 push-in terminals, BU type F0, gray (terminals 1 to 8), red (terminals 9 to 10), blue (terminals 11 to 12)	6ES7193-6CP42-2MB0	
Color code CC51, for 6 push-in terminals, for BU type C0, C1, gray (terminals 1 to 4), red (terminal 5), blue (terminal 6)	6ES7193-6CP51-2MC0	

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 degree of protection for PROFINET or alternatively for PROFIBUS
- Compact dimensions and high channel density
- 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 pre-wiring position for the front connector allows convenient wiring both when commissioning and making changes during operation

- The top hat rail integrated in the S7-1500 standard 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 a 830 mm-wide S7-1500 standard 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.
 - Integrated technological functions in selected modules, such as counting, pulse width modulation (PWM) or integrated switching cycle counters, make cost-effective and convenient solutions possible.
 - Selected digital output modules enable safety-related load group shutdown in accordance with SILCL 2 via an external safety relay.
- 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 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
 - MMC 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 BA and IM 155-5 PN ST) or four (IM 155-5 PN HF) IO Controllers
 - Module shared input/module shared output as system function for all S7-1500 I/O modules

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC 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

IM 155-5 PN BA

- Max. 30 I/O modules
- Shortest bus cycle time 1 ms
- Media redundancy (MRP)
- Shared device on up to 2 IO controllers
- Omission of SIMATIC Memory Card (SMC); IM replacement without PG using LLDP

IM 155-5 PN ST, IM 155-5 PN HF

- 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 µs
- Linking to the isochronous task of the CPU
- Prioritized fast startup (FSU) with max. 12 I/O modules
- Media Redundancy Protocol (MRP)
- Shared device on up to two IO controllers (when configuring using GSD file; depends on the respective configuration tool)
- Omission of SIMATIC Memory Card (SMC); IM replacement without PG using LLDP
- Operation of F-modules and PROFIsafe

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 IO controllers
- Configuration control (option handling)
- Module shared input and module shared output (MSI/MSO), i.e. the inputs or outputs of a module can be made available simultaneously to up to two IO controllers

The IM155-5 PN HF interface module has the following additional functions:

- Shared device on up to 4 IO controllers
- Module shared input and module shared 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)

Overview (continued)

	IM 155-5 PN BA	IM 155-5 PN ST	IM 155-5 PN HF
Article No.	6ES7155-5AA00-0AA0	6ES7155-5AA01-0AB0	6ES7155-5AA00-0AC0
Specifications			
IO modules	All except PROFIsafe	All	All
Max. number IO modules / IM	12	30	30
Max. number of bytes / slot	64 inputs	256 inputs	256 inputs
	64 outputs	256 outputs	256 outputs
Max. number bytes / station	64 inputs	512 inputs	512 inputs
	64 outputs	512 outputs	512 outputs
Update time	1 ms	250 µs	250 µs
Configuration			
GSDML	Yes	Yes	Yes
STEP 7	GSDML	GSDML	GSDML
TIA Portal	Yes	Yes	Yes
PCS 7	No	No	No
General functions			
Reset to factory settings	TIA Portal	TIA Portal	TIA Portal
Device replacement: without PG	LLDP	LLDP	LLDP
Configuration management (option handling)	No	Yes	Yes
I&M data	IM 0 ... 3	IM 0 ... 3	IM 0 ... 3
Isochronous mode	No	Yes	Yes
PROFIsafe	No	Yes	Yes
PROFINET functions			
RT	Yes	Yes	Yes
IRT	No	Yes	Yes
MRP	Yes	Yes	Yes
MRPD	No	No	No
S2 redundancy	No	No	Yes
Fast startup	No	Yes	Yes
Shared device	Yes; up to 2 ctrl.	Yes; up to 2 ctrl.	Yes; up to 4 ctrl.
MSI / MSO	Yes	Yes	Yes
Submodules	Yes	Yes	Yes

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200MP

Interface modules > IM 155-5 PN

Technical specifications

Article number	6ES7155-5AA00-0AA0 ET 200MP, IM 155-5 PN BA	6ES7155-5AA00-0AC0 ET 200MP, IM 155-5 PN HF	6ES7155-5AA01-0AB0 ET 200MP, IM 155-5 PN ST
General information			
Product type designation	IM 155-5 PN BA	IM 155-5 PN HF	IM 155-5 PN ST
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with			
• STEP 7 TIA Portal configurable/ integrated as of version	V14 with HSP 0187	V13 / V13	V14 or higher with HSP 0223 / integrated with V15 or higher
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	GSDML V2.32
• PROFINET as of GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes
Input current			
Current consumption (rated value)	1 A	0.2 A	0.2 A
Power loss			
Power loss, typ.	3 W	4.5 W	4.5 W
Address area			
Address space per station			
• Address space per station, max.	64 byte; per input / output	512 byte; per input / output	512 byte; per input / output
Hardware configuration			
Integrated power supply	Yes	Yes	Yes
Rack			
• Modules per rack, max.	12; I/O modules	30; I/O modules	30; I/O modules
Submodules			
• Number of submodules per station, max.	108; 9 submodules / I/O modules	256	
Interfaces			
Number of PROFINET interfaces	1; 2 ports (switch) RJ45	1	1
1. Interface			
Interface types			
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
• RJ 45 (Ethernet)	Yes	Yes	Yes
• BusAdapter (PROFINET)	No		
Protocols			
• PROFINET IO Device	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes; PROFINET MRP
Interface types			
RJ 45 (Ethernet)			
• 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)
• 100 Mbps	Yes	Yes	Yes
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
Protocols			
PROFINET IO Device			
Services			
- Isochronous mode	No	Yes	Yes
- Open IE communication	Yes		
- IRT	No	Yes	Yes
- PROFIenergy	No	No	No
- Prioritized startup	No	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	4	2

Technical specifications (continued)

Article number	6ES7155-5AA00-0AA0 ET 200MP, IM 155-5 PN BA	6ES7155-5AA00-0AC0 ET 200MP, IM 155-5 PN HF	6ES7155-5AA01-0AB0 ET 200MP, IM 155-5 PN ST
Redundancy mode			
• MRP	Yes	Yes	Yes
• MRPD	No	Yes	No
• PROFINET system redundancy (S2)	No	Yes	No
- on S7-1500R/H		Yes	
- on S7-400H		Yes; With GSDML file as of STEP 7 V5.5 SP3	
• Redundant PROFINET configuration (R1)		No	
• H-Sync forwarding		Yes	
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• SNMP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	No	Yes	Yes
Equidistance	No	Yes	Yes
shortest clock pulse		250 µs	250 µs
max. cycle		4 ms	4 ms
Interrupts/diagnostics/status information			
Status indicator	Yes	Yes	Yes
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
Diagnostics indication LED			
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• MAINT LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
• Connection display LINK TX/RX	Yes; 2x green-yellow LEDs	Yes; yellow LED	Yes; 2x green-yellow LEDs
Standards, approvals, certificates			
Network loading class	2		
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.		2 000 mm	
Dimensions			
Width	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	236 g	350 g	

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200MP

Interface modules > IM 155-5 PN

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 standard rail IM 155-5 PN BA, Basic version IM 155-5 PN ST, Standard version IM 155-5 PN HF, High Feature version with additional functions	6ES7155-5AA00-0AA0 6ES7155-5AA01-0AB0 6ES7155-5AA00-0AC0	
Accessories Front flap for IM 155-5 PN (spare part), 5 units 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 elements must be ordered separately <ul style="list-style-type: none"> • 2000 mm 	6ES7528-0AA70-7AA0 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	6ES7590-5AA00-0AA0	
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 24/48/60 V DC input voltage, power 60 W, buffering functionality 120/230 V AC input voltage, power 60 W	6ES7505-0KA00-0AB0 6ES7505-0RA00-0AB0 6ES7505-0RB00-0AB0 6ES7507-0RA00-0AB0	
Power connector With coding element for power supply module; spare part, 10 units	6ES7590-8AA00-0AA0	
Load power supply 24 V DC/3 A 24 V DC/8 A	6EP1332-4BA00 6EP1333-4BA00	
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
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 RJ45 plug 180 180° cable outlet 1 unit 10 units 50 units		6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0
IE FC TP standard cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; Sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m		6XV1840-2AH10
IE FC TP trailing cable 2 x 2 (Type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug 180/90 for trailing cable use; PROFINET-compatible; with UL approval; Sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m		6XV1840-3AH10
IE FC TP marine cable 2 x 2 (Type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug 180/90 marine certified; Sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m		6XV1840-4AH10
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables		6GK1901-1GA00

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 ET 200MP, IM155-5 DP ST
General information	
Product type designation	IM 155-5 DP ST
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 / V13
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
Input current	
Current consumption (rated value)	0.2 A; at 24 V DC and without load
Power loss	
Power loss, typ.	4 W
Address area	
Address space per station	
• Address space per station, max.	244 byte; per input / output
Hardware configuration	
Integrated power supply	Yes
Rack	
• Modules per rack, max.	12; I/O modules
Interfaces	
Number of PROFIBUS interfaces	1

Article number	6ES7155-5BA00-0AB0 ET 200MP, IM155-5 DP ST
1. Interface	
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP slave	Yes
RS 485	
• Transmission rate, max.	12 Mbit/s
PROFIBUS DP	
Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- DPV1	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	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
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	360 g

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200MP

Interface modules > IM 155-5 DP

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-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-0JH10
Accessories		FC flexible cable PROFIBUS bus cable, flexible, with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order 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-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	6XV1830-3EH10
SIMATIC S7-1500 standard 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 elements 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 6ES7590-1BC00-0AA0	FC bus cable PROFIBUS Food bus cable with PE sheath for use in the food and beverages industry, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-0GH10
PE connection element for standard rail 2000 mm 20 units	6ES7590-5AA00-0AA0	FC underground cable PROFIBUS underground cable, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 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-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	6XV1831-2L
PROFIBUS connector <ul style="list-style-type: none"> • Connector for PROFIBUS, up to 12 Mbps, 90° cable outlet, insulation displacement system, without PG socket • Connector for PROFIBUS, up to 12 Mbps, 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-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order 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		

Overview



- Interface module for linking the ET 200MP to PROFINET
- Handles data exchange with the PROFINET I/O 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 LLDAP

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.

Ordering data

SIPLUS IM 155-5 PN interface module

(Extended temperature range and exposure to environmental substances)

IP 20 degree of protection, module width 35 mm, installation on S7-1500 mounting rail

Accessories

Article No.

6AG1155-5AA01-7AB0

See SIMATIC ET 200MP, IM 155-5 PN interface module, page 9/216

Technical specifications

Article number	6AG1155-5AA01-7AB0
Based on	6ES7155-5AA01-0AB0 SIPLUS ET 200MP IM 155-5 PN ST
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; at > +60 °C no module permissible left of the IM
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	40 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); from 2 000 m max. 132 V AC
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200MP

I/O modules

Overview

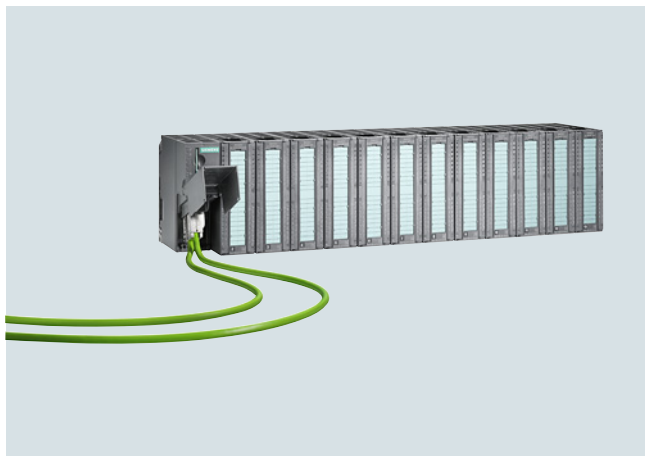


I/O modules constitute the interface of the SIMATIC ET 200MP to the process:

- 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

You can find additional information under SIMATIC S7-1500, catalog section 4.

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 Mbps
- Ex approval to Cat. 3 for Zone 2 acc. to ATEX 100 a
- Fail-safe digital in/outputs as well as analog inputs for safety-oriented signal processing in accordance with PROFIsafe
- Supports modules with expanded user data, e.g. HART modules with HART minor variables

Availability

As part of our established product portfolio, the SIMATIC S7-300 / ET 200M system families will generally be available until 2023. Following the product phase-out declaration, products will be available as spare parts for another ten years.

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)	<ul style="list-style-type: none"> • 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

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200M

Interface modules > IM 153-1/153-2

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:

IM153-1 Standard

The IM153-1 is one 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.

IM153-2 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 IM153-2 High Feature is available. This IM is also designed for use with the PCS7 in the field of process-oriented 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 1 ms.

Technical specifications

Article number	6ES7153-1AA03-0XB0	6ES7153-2BA10-0XB0	6ES7153-2BA70-0XB0
	ET200M, Interface Module IM153-1	ET200M, Interface Module IM153-2 HF	ET200M, INTERFACE MODULE IM153-2 HF OUTDOOR
General information			
Product type designation	IM 153-1 DP ST	IM 153-2 DP HF	IM 153-2 HF
Supply voltage			
Rated value (DC)	24 V	24 V	
• 24 V DC	Yes	Yes	Yes
external protection for power supply lines (recommendation)	not necessary	2,5 A	2,5 A
Input current			
Current consumption, max.	350 mA; at 24 V DC	650 mA; with 24 V DC supply	650 mA
Output voltage			
Rated value (DC)	5 V		
Output current			
for backplane bus (5 V DC), max.	1 A	1.5 A	1.5 A
Power loss			
Power loss, typ.	3 W	5.5 W	5.5 W
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

Technical specifications (continued)

Article number	6ES7153-1AA03-0XB0 ET200M, Interface Module IM153-1	6ES7153-2BA10-0XB0 ET200M, Interface Module IM153-2 HF	6ES7153-2BA70-0XB0 ET200M, INTERFACE MODULE IM153-2 HF OUTDOOR
Interfaces			
Transmission procedure	RS 485	RS 485	RS 485
PROFIBUS DP			
• Node addresses	1 to 125 permitted	1 to 125 permitted	1 to 125 permitted
• automatic detection of transmission rate	Yes	Yes	Yes
• Output current, max.	90 mA	70 mA	70 mA
• Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
• SYNC capability	Yes	Yes	Yes
• FREEZE capability	Yes	Yes	Yes
• Direct data exchange (slave-to-slave communication)	Yes; Sender	Yes; as publisher with all IO, as subscriber with F-IO only	Yes; as publisher with all IO, as subscriber with F-IO only
• Design of electrical connection of PROFIBUS interface	9-pin sub D socket	9-pin sub D	9-pin sub D
1. Interface			
PROFIBUS DP slave			
• GSD file	(for DPV1) SIEM801D.GSD; SI01801D.GSG	SI05801E.GSG	SI05801E.GSG
• automatic baud rate search	Yes	Yes	Yes
Protocols			
Bus protocol/transmission protocol	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170
Protocols (Ethernet)			
• TCP/IP	No	No	
Potential separation			
Potential separation exists	Yes	Yes	Yes
Isolation			
Isolation tested with	Isolation voltage 500 V	Isolation voltage 500 V	Isolation voltage 500 V
Degree and class of protection			
IP degree of protection	IP20	IP20	IP20
Ambient conditions			
Ambient temperature during operation			
• min.	0 °C	0 °C	
• max.	60 °C	60 °C	
Altitude during operation relating to sea level			
• Installation 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
<hr/>			
Article number	6ES7195-7HD10-0XA0 ET200M, Bus Unit f. 2 IM 153-2 red.		
Dimensions			
Width	97 mm		
Height	92 mm		
Depth	30 mm		
Weights			
Weight, approx.	133 g		

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200M

Interface modules > IM 153-1/153-2

Technical specifications (continued)

Article number	6ES7195-7HA00-0XA0 ET200M, Bus Module f. PS and IM 153	6ES7195-7HB00-0XA0 ET200M, Bus Module f. 2 40mm I/O Modules	6ES7195-7HC00-0XA0 ET200M, Bus Module f. 1 80mm I/O Module
Dimensions			
Width	97 mm	97 mm; 80 mm when installed	97 mm; 80 mm when installed
Height	92 mm	92 mm	92 mm
Depth	30 mm	30 mm	30 mm
Weights			
Weight, approx.	111 g	140 g	127 g

Ordering data

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

6ES7153-2BA10-0XB0
6ES7153-2BA70-0XB0

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

6ES7153-2AR04-0XA0

Accessories

PROFIBUS bus connector

90° outgoing cable, terminating resistor with disconnecting function, up to 12 Mbps, 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 standard 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 standard 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

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 supply:
Current DVD "S7 Manual Collection" and the three subsequent updates

6ES7998-8XC01-8YE2

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 PROFIsafe 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 Mbps / 100 Mbps (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
General information		
Product type designation	IM 153-4 PN ST	IM 153-4 PN HF
Supply voltage		
Rated value (DC)	24 V	24 V
• 24 V DC	Yes	Yes
external protection for power supply lines (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)
Input current		
Current consumption, max.	600 mA; with 24 V DC supply	600 mA; with 24 V DC supply
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 loss		
Power loss, typ.	6 W	6 W
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

I/O SystemsSIMATIC ET 200 systems for the control cabinet
SIMATIC 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
Protocols		
Bus protocol/transmission protocol	PROFINET IO	PROFINET IO
Protocols (Ethernet)		
• TCP/IP	No	Yes
• SNMP		Yes
• LLDP		Yes
• ping		Yes
• ARP		Yes
PROFINET IO Device Services		
- Isochronous mode		Yes
- IRT		Yes
- PROFINET energy		No
- Prioritized startup		Yes
- Shared device		Yes
- Number of IO Controllers with shared device, max.		2
Redundancy mode		
• MRP	Yes	Yes
• PROFINET system redundancy (S2)	No	Yes
Interrupts/diagnostics/status information		
Diagnostics indication LED		
• for module diagnostics	Yes	Yes
• Connection to network LINK (green)	Yes	Yes
• Transmit/receive RX/TX (yellow)	Yes	Yes
Potential separation		
Potential separation exists	Yes	Yes; Only direction PROFINET, RWB is not separated
Isolation		
Isolation tested with	500 V DC	Between PROFINET and 24 V supply: 1 500 V AC, between functional grounding and 24 V supply: 500 V DC
Degree and class of protection		
IP degree of protection	IP20	IP20
Ambient conditions		
Ambient temperature during operation		
• min.	0 °C	0 °C
• max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Installation 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 to connect an ET 200M to PROFINET		
Standard	6ES7153-4AA01-0XB0	
High Feature	6ES7153-4BA00-0XB0	
Accessories		
Bus modules for ET 200M		
• For accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover	6ES7195-7HA00-0XA0	
• For accommodating two 40 mm-wide I/O modules for the hot-swapping function	6ES7195-7HB00-0XA0	
• For accommodating one 80 mm-wide I/O module for the hot-swapping function	6ES7195-7HC00-0XA0	
SIMATIC Micro Memory Card 64 KB ¹⁾	6ES7953-8LF31-0AA0	
SIMATIC DP standard rail for ET 200M Accommodates bus modules; for hot-swapping function		
• Length: 483 mm (19")	6ES7195-1GA00-0XA0	
• Length: 530 mm	6ES7195-1GF30-0XA0	
• Length: 620 mm	6ES7195-1GG30-0XA0	
• Length: 2 000 mm	6ES7195-1GC00-0XA0	
SIMATIC S7-300 mounting 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	
Power supply connector For connection of the 24 V DC power supply; spare part, 1 pack containing 10 units		
Spring-loaded connections	6ES7193-4JB00-0AA0	
Screw terminal connections	6ES7193-4JB50-0AA0	
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 supply: 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		6GK1901-1BB10-2AA0
10 units		6GK1901-1BB10-2AB0
50 units		6GK1901-1BB10-2AE0
Industrial Ethernet FastConnect installation cables		
• FastConnect standard cable		6XV1840-2AH10
• FastConnect trailing cable		6XV1840-3AH10
• FastConnect marine cable		6XV1840-4AH10
Industrial Ethernet FastConnect		
Stripping tool		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

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200M

Interface modules > SIPLUS ET 200M 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	6AG1153-2BA10-2XY0	6AG1153-2BA10-7XB0
Based on	6ES7153-1AA03-0XB0 SIPLUS IM153-1	6ES7153-2BA10-0XY0 SIPLUS ET200M IM153-2 EN50155	6ES7153-2BA10-0XB0 SIPLUS ET200M IM153-2 HF
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax
• At cold restart, min.	-25 °C	-25 °C	-25 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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)

Technical specifications (continued)

Article number	6AG1153-1AA03-2XB0	6AG1153-2BA10-2XY0	6AG1153-2BA10-7XB0	
Based on	6ES7153-1AA03-0XB0	6ES7153-2BA10-0XY0	6ES7153-2BA10-0XB0	
	SIPLUS IM153-1	SIPLUS ET200M IM153-2 EN50155	SIPLUS ET200M IM153-2 HF	
Resistance				
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	
Use on land craft, rail vehicles and special-purpose vehicles				
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request		
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *		
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust; *		
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *		Yes; Class 6S3 incl. sand, dust; *	
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	
<hr/>				
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
	SIPLUS ET200M DP bus module	SIPLUS DP bus module ET200M 2X40	SIPLUS ET200M bus module	SIPLUS ET 200M DP bus module
Ambient conditions				
Ambient temperature during operation				
• min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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)

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200M

Interface modules > SIPLUS ET 200M IM 153-1/153-2

Technical specifications (continued)

Article number	6AG1195-7HA00-2XA0	6AG1195-7HB00-7XA0	6AG1195-7HC00-2XA0	6AG1195-7HD10-2XA0
Based on	6ES7195-7HA00-0XA0 SIPLUS ET200M DP bus module	6ES7195-7HB00-0XA0 SIPLUS DP bus module ET200M 2X40	6ES7195-7HC00-0XA0 SIPLUS ET200M bus module	6ES7195-7HD10-0XA0 SIPLUS ET 200M DP bus module
Resistance				
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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

- Extended temperature range and exposure to media

6AG1153-1AA03-2XB0

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

- Extended temperature range and exposure to media
- Conforms to EN 50155

6AG1153-2BA10-7XB0

6AG1153-2BA10-2XY0

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

- Extended temperature range and exposure to media

6AG1195-7HA00-2XA0

Bus module for accommodating two 40 mm-wide I/O modules for the hot-swapping function

- Extended temperature range and exposure to media

6AG1195-7HB00-7XA0

Bus module for accommodating one 80 mm-wide I/O module for the hot-swapping function

- Extended temperature range and exposure to media

6AG1195-7HC00-2XA0

Bus module for accommodating two IM 153 modules for the hot-swapping function; for setting up redundant systems

- Extended temperature range and exposure to media

6AG1195-7HD10-2XA0

RS 485 bus connector with 90° cable outlet

Max. transfer rate 12 Mbps

Extended temperature range and exposure to media

- without PG interface
- with PG interface

6AG1972-0BA12-2XA0
6AG1972-0BB12-2XA0

Additional accessories

see SIMATIC ET 200M IM 153-1/153-2, page 9/224

Overview



- For connection of ET 200M as IO Device to PROFINET IO (copper, RJ45)
- 2 versions:
 - IM 153-4 PN STANDARD
 - IM 153-4 PN HIGH FEATURE: additionally to the STANDARD version, operation of PROFI-safe F and HART modules
- Integrated 2-port switch
- 12 modules per station
- Usable I/O quantity structure: 192 bytes each
- Active backplane bus for hot swapping of modules optionally available
- Baud rate 10 Mbps / 100 Mbps (Autonegotiation/Full Duplex)
- I&M functions according to PNO-Guideline Order-No. 3.502, Version V1.1

Notes:

Micro Memory Card with min. 64 KB required if not all participants in the network support LLDP (Link Layer Discovery Protocol; neighbor detection).

SIPLUS extreme products are based on 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 during operation	
• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over 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 IM 153-4 PN interface module, page 9/227

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200M

I/O modules > Digital modules, analog modules

Overview Digital modules



- Digital inputs and outputs
- For flexible adaptation of the controller to the respective task
- For connecting digital sensors and actuators

For further information, see SIMATIC S7-300, chapter 5.

Overview Analog modules



- Analog inputs and outputs
- For solving even complex tasks with analog process signals
- For connecting analog actuators and sensors without additional measuring amplifiers

HART modules

- For the use of HART (**H**ighway **A**ddressable **R**emote **T**ransducer) devices in the SIMATIC S7 and PCS 7 automation systems
- All transducers or HART sensors/actuators which are certified for communication using the HART protocol can be connected
- In addition, conventional transducers with 4 to 20 mA technology without HART protocol can also be connected
- Can only be plugged into ET 200M with IM153-2

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
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
• Supply current, max.	60 mA
Analog inputs	
Number of analog inputs	8
permissible input current for current input (destruction limit), max.	40 mA
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
Cable length	
• shielded, max.	800 m
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 at 50 Hz; 16.6 ms at 60 Hz; 100 ms at 100 Hz
• Basic conversion time, including integration time (ms)	55 ms @ 60 Hz, 65 ms @ 50 Hz, 305 ms @ 100 Hz
• Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 Hz
Smoothing of measured values	
• parameterizable	Yes

Article number	6ES7331-7TF01-0AB0 SM331, 8AI, 0/4-20MA HART
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 range), (+/-)	0.1 %
Operational error limit in overall temperature range	
• Current, relative to input range, (+/-)	0.15 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.1 %
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.	40 dB
• Common mode interference, min.	100 dB
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200M

I/O modules > Analog input module with HART

Technical specifications (continued)

Article number	6ES7331-7TF01-0AB0 SM331, 8AI, 0/4-20MA HART
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Channel fault indicator F (red)	Yes
Potential separation	
Potential separation analog inputs	
• between the channels	No
• between the channels and backplane bus	Yes
Degree and class of protection	
IP degree of protection	IP20
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-loaded 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 mounting rail for ET 200M	
For mounting of up to 5 bus modules for	
• Length: 483 mm (19")	6ES7195-1GA00-0XA0
• Length: 530 mm	6ES7195-1GF30-0XA0
SIMATIC S7-300 mounting 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
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
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

Article number	6ES7332-8TF01-0AB0 SM332, 8AO, 0/4 - 20MA HART
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Basic execution time of the module (all channels released)	10 ms; 10 ms in AO mode 50 ms in HART-AO mode
Settling time	
• for resistive load	0.1 ms
• for inductive load	0.5 ms
Errors/accuracies	
Output ripple (relative to output range, 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 range), (+/-)	0.05 %
Operational error limit in overall temperature range	
• Current, relative to output range, (+/-)	0.2 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to output range, (+/-)	0.1 %

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200M

I/O modules > Analog output module with HART

Technical specifications (continued)

Article number	6ES7332-8TF01-0AB0 SM332, 8AO, 0/4 - 20MA HART
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
Potential separation	
Potential separation analog outputs	
• between the channels	No
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes
Degree and class of protection	
IP degree of protection	IP20
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	6ES7332-8TF01-0AB0
HART analog output, 8 outputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2	
Accessories	
Front connector (1 unit)	6ES7392-1AJ00-0AA0
20-pin, with screw contacts	
LK 393 cable guide	6ES7393-4AA00-0AA0
Mandatory for operation in hazardous areas	
SIMATIC DP standard rail for ET 200M	
For mounting of up to 5 bus modules for	
• Length: 483 mm (19")	6ES7195-1GA00-0XA0
• Length: 530 mm	6ES7195-1GF30-0XA0
SIMATIC S7-300 mounting 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	
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 supply: Current DVD "S7 Manual Collection" and the three subsequent updates	
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 and range can be selected for each channel
- Diagnostics and diagnostic alarm parameterizable

Technical specifications

Article number	6ES7331-7TB10-0AB0 SM331, 2AI, 0/4-20MA HART
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Input current	
from load voltage L+ (without load), max.	180 mA
from backplane bus 5 V DC, max.	100 mA
Output voltage	
Power supply to the transmitters	
• present	Yes
• Rated value (DC)	15 V; at 22 mA
• short-circuit proof	Yes; approx. 30 mA
• No-load voltage (DC)	29.6 V
Analog inputs	
Number of analog inputs	2
permissible input current for current input (destruction limit), max.	40 mA
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	400 m
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; 10 bit to 15 bit + sign
• Integration time, parameterizable	Yes
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms
• Basic conversion time, including integration time (ms)	2,5 / 16,67 / 20 / 100 (1 channel enabled); 7,5 / 50 / 60 / 300 (2 channels enabled)
• Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 / 400 Hz

Article number	6ES7331-7TB10-0AB0 SM331, 2AI, 0/4-20MA HART
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), (+/-)	0.01 %/K
Crosstalk between the inputs, min.	130 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
Operational error limit in overall temperature range	
• Current, relative to input range, (+/-)	0.45 %; From 0/4 to 20 mA
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.1 %; From 0/4 to 20 mA
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.	60 dB
• Common mode interference, min.	130 dB
Interrupts/diagnostics/status information	
Diagnostics function	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable, channels 0 and 1
Diagnostic messages	
• Diagnostic information readable	Yes; possible
• Overrange	Yes; Red LED, signal
• Wire-break in signal transmitter cable	Yes; Red LED, signal
• Short-circuit of the signal encoder cable	Yes; Red LED, signal
• HART communication active	Yes; green LED (H)
Diagnostics indication LED	
• Group error SF (red)	Yes
• Channel fault indicator F (red)	Yes

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200M

I/O modules > Ex-analog input module with HART

Technical specifications (continued)

Article number	6ES7331-7TB10-0AB0 SM331, 2AI, 0/4-20MA HART
Ex(i) characteristics	
Module for Ex(i) protection	Yes
Maximum values of input circuits (per channel)	
• Co (permissible external capacity), max.	62 nF
• Io (short-circuit current), max.	96.1 mA
• Lo (permissible external inductivity), max.	3 mH
• Po (power of load), max.	511 mW
• Uo (output no-load voltage), max.	26 V
• Um (fault voltage), max.	250 V; DC
• Ta (permissible ambient temperature), max.	60 °C
Potential separation	
Potential separation analog inputs	
• between the channels	Yes
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
Use in hazardous areas	
• Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4
• Type of protection acc. to KEMA	ATEX II 3 G (2) GD Ex nA [ib Gb] [ib IIIC Db] IIC T4 Gc
• Test number KEMA	DEKRA 14 ATEX 0052X
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Connection method	
required front connector	1x 20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	260 g

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 V5.0 and higher

6ES7331-7TB10-0AB0

Accessories

Front connector¹⁾

20-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AJ00-0AA0
6ES7392-1AJ00-1AB0

LK 393 cable guide

Mandatory for operation in hazardous areas

6ES7393-4AA00-0AA0

SIMATIC DP mounting rail for ET 200M

For mounting of up to 5 bus modules for

- Length: 483 mm
- Length: 530 mm

6ES7195-1GA00-0XA0
6ES7195-1GF30-0XA0

SIMATIC S7-300 mounting 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

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

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	6ES7332-5TB10-0AB0 SM332, 2AO, 0/4 - 20MA HART
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Input current	
from load voltage L+ (without load), max.	150 mA
from backplane bus 5 V DC, max.	100 mA
Analog outputs	
Number of analog outputs	2
Current output, no-load voltage, max.	19 V
Cycle time (all channels) max.	5 ms
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.	650 Ω
• with current outputs, inductive load, max.	7.5 mH
Destruction limits against externally applied voltages and currents	
• Voltages at the outputs towards MANA	max. 17 V / -0.5 V
• Current, max.	60 mA / -1 A
Cable length	
• shielded, max.	400 m

Article number	6ES7332-5TB10-0AB0 SM332, 2AO, 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; + sign
• Conversion time (per channel)	40 ms
Settling time	
• for resistive load	2.5 ms
• for capacitive load	4 ms
• for inductive load	2.5 ms
Errors/accuracies	
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %
Linearity error (relative to output range), (+/-)	0.03 %
Temperature error (relative to output range), (+/-)	0.01 %/K
Crosstalk between the outputs, min.	130 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.005 %
Operational error limit in overall temperature range	
• Current, relative to output range, (+/-)	0.55 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to output range, (+/-)	0.15 %

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200M

I/O modules > Ex-analog output module with HART

Technical specifications (continued)

Article number	6ES7332-5TB10-0AB0 SM332, 2AO, 0/4 - 20MA HART
Interrupts/diagnostics/ status information	
Diagnostics function	Yes; Parameterizable
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Diagnostic information readable	Yes; possible
• Overrange	Yes
• Wire-break	Yes; as of output value > 0.5 mA
• HART communication active	Yes; green LED (H)
Diagnostics indication LED	
• Group error SF (red)	Yes; Red LED
• Channel fault indicator F (red)	Yes; per channel
Ex(i) characteristics	
Module for Ex(i) protection	Yes
Maximum values of output circuits (per channel)	
• Co (permissible external capacity), max.	230 nF
• Io (short-circuit current), max.	66 mA
• Lo (permissible external inductivity), max.	7.5 mH
• Po (power of load), max.	506 mW
• Uo (output no-load voltage), max.	19 V
• Um (fault voltage), max.	60 V; DC
• Ta (permissible ambient temperature), max.	60 °C
Potential separation	
Potential separation analog outputs	
• between the channels	Yes
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
FM approval	Yes
Use in hazardous areas	
• Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4
• Type of protection acc. to KEMA	ATEX II 3 G (2) GD Ex nA [ib Gb] [ib IIC Db] IIC T4 Gc
• Test number KEMA	DEKRA 14 ATEX 0053X
Connection method	
required front connector	20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	290 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

For HART protocol V5.0 and higher

6ES7332-5TB10-0AB0

Accessories

Front connectors

20-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AJ00-0AA0

6ES7392-1AJ00-1AB0

LK 393 cable guide

6ES7393-4AA00-0AA0

Mandatory for operation in hazardous areas

SIMATIC DP mounting rail for ET 200M

For mounting of up to 5 bus modules for

- Length: 483 mm (19")
- Length: 530 mm

6ES7195-1GA00-0XA0

6ES7195-1GF30-0XA0

SIMATIC S7-300 mounting 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

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

Software for machine labeling of modules directly from the STEP 7 project

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

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 supply: Current DVD "S7 Manual Collection" and the three subsequent updates

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 during operation	
• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL use
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

Article No.

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

6AG1331-7TF01-7AB0

Accessories

See SIMATIC ET 200M analog input module with HART, page 9/234

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200M

I/O modules > SIPLUS S7-300 analog output module with HART

Overview



- Can only be plugged onto 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 during operation	
• min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

Article No.

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

6AG1332-8TF01-2AB0

Accessories

See SIMATIC SM 332 analog output module with HART, page 9/236

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 and 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 2AI HART
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over 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

6AG1331-7TB00-7AB0

Accessories

See SIMATIC ET 200M Ex-analog input module with HART, page 9/238

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200M

I/O modules > F digital/analog modules, Ex modules

Overview F digital/analog modules



The fail-safe SIMATIC S7 CPUs and the fail-safe signal modules of SIMATIC ET 200S, ET 200pro, ET 200eco and ET 200M have been specially developed for distributed, safety-related applications in production engineering. Thanks to the discreetly modular structure of the fail-safe I/Os, safety technology only has to be 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
- Mixed configuration of F-modules and standard modules in a station
- Single-bus concept; fail-safe signals and standard signals are transferred over a single bus medium (PROFIBUS DP, PROFINET)

Totally Integrated Automation (TIA)

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

Whereas standard automation (classical PLCs) and safety automation (electromechanics) are still separate today, these two worlds are growing together into a uniform, integrated overall system.

Siemens can therefore present itself as a complete supplier for automation technology in which safety engineering is part of standard automation and system-wide integration exists.

For further information, see SIMATIC S7-300, chapter 5.

Overview Ex modules



- Input/output modules for applications in chemical plants with explosion hazards
- For connecting sensors and actuators from zones 1 and 2 of plants with explosion hazards
- Associated electrical equipment Ex [ib] [ibD] IIC
- For separating the non-intrinsically-safe electrical circuits of the automation system and the intrinsically-safe electrical circuits of the process

For further information, see SIMATIC S7-300, chapter 5.

Overview



Function modules unburden the CPU of work-intensive tasks such as counting, positioning and controlling

Module spectrum

- Counter modules
- Positioning modules for rapid traverse and creep speed drives
- Positioning modules for stepper motors
- Positioning modules for servo motors
- Positioning and continuous path modules
- SSI position detection modules
- Electronic cam controllers
- High-speed Boolean processor
- Controller modules

Function modules	
Counting	FM 350-1 counter module
	FM 350-2 counter module
Positioning	• of rapid traverse and creep speed drives
	FM 351 positioning module
Position and path control	FM 357-2 path and position control module ¹⁾
SSI position detection	SM 338 POS input modules
Electronic cam control	FM 352 electronic cam controller
High speed logic operation	FM 352-5 high-speed Boolean processor
Controlling	FM 355 controller module
	FM 355-2 temperature controller module
Weighing and proportioning electronics	SIWAREX

¹⁾ Not for ET 200M

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200M

I/O modules > Function modules

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 style="font-size: small; vertical-align: middle;" type="checkbox"/> ³⁾	<input type="checkbox"/>	<input style="font-size: small; vertical-align: middle;" type="checkbox"/> ³⁾	<input type="checkbox"/>	<input style="font-size: small; vertical-align: middle;" type="checkbox"/> ³⁾	<input type="checkbox"/>	<input type="checkbox"/>
FM 352-5 high-speed Boolean processor	6ES7352-5AH10-0AE0	<input style="font-size: small; vertical-align: middle;" type="checkbox"/> ³⁾	<input type="checkbox"/>	<input style="font-size: small; vertical-align: middle;" type="checkbox"/> ³⁾	<input type="checkbox"/>	<input style="font-size: small; vertical-align: middle;" type="checkbox"/> ³⁾	<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 > ET 200M > 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 pre-assembled 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.

Overview Special modules

The special modules provide the user with functions for diagnostics and 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 Power supplies

- Load current supplies for S7-300/ET 200M
- For converting the line voltage to the required operating voltage (24 V DC)
- Output current 2 A, 5 A or 10 A

For further information, see SIMATIC S7-300, chapter 5.

I/O Systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Overview



The ET 200iSP is a modular, intrinsically-safe I/O system with IP30 degree of protection which can be operated in gas and dust atmospheres at ambient temperatures from -20 to +70 °C. It is optimized for use with SIMATIC PCS 7 and SIMATIC S7, but can also be integrated in other systems such as SIMATIC S5 per GSD file.

In accordance with ATEX directive 2014/34/EU, the ET 200iSP remote I/Os stations can be installed directly in the Ex zones 1, 2, 21 or 22 as well as in non-hazardous areas. The intrinsically-safe sensors, actuators and HART field devices can also be located in zone 0 or 20 if necessary.

The modular design of the ET 200iSP makes it possible to optimally adapt the remote I/O stations to the respective automation task through individual configuration and flexible expansion. To increase plant availability, the pressure-encapsulated power supply and the intrinsically-safe PROFIBUS DP connection (RS 485-iS) of the stations can also be of redundant design.

The modern architecture with hardwiring and automatic slot coding supports pre-wiring without the electronic modules, simple and reliable hot swapping of individual modules without a fire certificate as well as configuration in run (CiR).

In addition to analog and digital I/O modules for the automation of the technological functions of the process (Basic Process Control), the range of electronic modules also includes fail-safe F-I/O modules for implementing safety applications.

The various types of electronic module can be arranged mixed within a station. Comprehensive diagnostic options facilitate commissioning and troubleshooting.

Technical specifications

ET 200iSP – general		
Degree of protection	IP30	
Ambient temperature	-20 ... +70 °C	
<ul style="list-style-type: none"> Horizontal mounting position Other mounting positions 	-20 ... +50 °C	
Loading of media	According to ISA-S71.04 severity level G1; G2; G3 (except for NH3, only level G2 in this case)	
EMC	Electromagnetic compatibility according to NE21	
Vibration resistance	0.5 g continuously, 1 g periodically	
Approvals, standards		
<ul style="list-style-type: none"> ATEX 	II 2 G (1) GD I M2 Zone 1 Zone 1 Class I, II, III	Ex de [ia/ib] IIC T4 Ex de [ia/ib] I Ex de [ia/ib] IIC T4 BR-Ex de [ia/ib] IIC T4 NI Division 2, Groups A, B, C, D, E, F, G T4 AIS Division 1, Groups A, B, C, D, E, F, G
<ul style="list-style-type: none"> IECEX INMETRO cFMus 	Class I Class I, II, III	Zone 1, AEx de [ia/ib] IIC T4 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
<ul style="list-style-type: none"> cULus 	Class I Class I, II, III	Zone 1, AEx de [ia/ib] IIC T4
<ul style="list-style-type: none"> NEPSI PROFIBUS IEC CE 	Class I Ex de ib[ia] IIC T4 Ex de [ia/ib] IIC T4 EN 50170, Volume 2 IEC 61131, Part 2	In accordance with ATEX directive 2014/34/EU, EMC Directive 2014/30/EU and LVD-guideline 2014/35/EU
<ul style="list-style-type: none"> KCC Marine approval 	Korea Certification Classification companies <ul style="list-style-type: none"> 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) 	

Overview



An ET 200iSP power supply unit consists of a TM-PS terminal module (A or B) and a PS power supply module which is plugged onto this. Terminal modules and power supply modules can be ordered separately.

The power supply modules are suitable for both individual operation (standard) and redundant operation. Depending on the operating mode, they must be combined with the terminal modules as follows:

- Standard: 1 × PS on TM-PS-A UC
- Redundancy: 1 × PS on TM-PS-A UC (left) plus 1 × PS on TM-PS-B UC (right)

Power supply modules are available for supplies of 24 V DC and 120/230 V AC.

The operating state of the power supply modules is indicated by two LEDs on the IM 152 interface module (one for each module).

Technical specifications

Article number	6ES7138-7EA01-0AA0	6ES7138-7EC00-0AA0
	ET200iSP, POWER SUPPLY MODULE	ET200iSP, POWER SUPPLY MOD. AC120/230V
Supply voltage		
Rated value (DC)	24 V	
Rated value (AC)		230 V; 120/230 V AC
Reverse polarity protection	Yes	
Line frequency		
• permissible range, lower limit		47 Hz
• permissible range, upper limit		63 Hz
Input current		
from supply voltage L+, max. from supply voltage L1, max.	4 A	1.04 A; at rated voltage 230 VAC:0.45A at rated voltage 120 VAC:0.75A
Interrupts/diagnostics/ status information		
Status indicator	Yes	Yes
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		
Maximum values of input circuits (per channel)		
• Um (fault voltage), max.	250 V; DC	264 V; AC/DC
Potential separation		
primary/secondary	Yes	Yes
between supply voltage and electronics	Yes	No
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

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

Power supply unit

Technical specifications (continued)

Article number	6ES7193-7DA20-0AA0 ET200iSP, TERM. MOD. TM-PS-A UC	6ES7193-7DB20-0AA0 ET200iSP, TERM. MOD. TM-PS-B UC
Standards, approvals, certificates		
CE mark	Yes	Yes
Use in hazardous areas		
• Type of protection acc. to EN 50020 (CENELEC)	see ET 200iSP system	see ET 200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242
Dimensions		
Width	60 mm	60 mm
Height	190 mm	190 mm
Depth	52 mm	52 mm
Weights		
Weight, approx.	230 g	230 g

Ordering data	Article No.	Article No.
PS 24 V DC power supply module for ET 200iSP	6ES7138-7EA01-0AA0	TM-PS-A UC terminal module For standard operation 6ES7193-7DA20-0AA0
PS 120/230 V AC power supply module for ET 200iSP	6ES7138-7EC00-0AA0	TM-PS-B UC terminal module Additional terminal module for redundant operation 6ES7193-7DB20-0AA0

Overview



The IM 152 interface module connects the ET 200iSP to the PROFIBUS DP with intrinsically-safe RS 485-iS transmission technology with transmission rates of up to 1.5 Mbps. A redundant connection is also possible. In this case the ET 200iSP is connected via two interface modules to two redundant PROFIBUS DP segments of a fault-tolerant automation system.

The IM 152 is plugged onto a special terminal module (to be ordered separately). The following terminal modules are available:

- TM-IM/IM terminal module for two interface modules (for redundant PROFIBUS DP connection)
- TM-IM/EM60 terminal module for one interface module and one watchdog, reserve or electronic module (except 2 DQ relay)
 - with blue screw-type or spring-loaded terminals for hazardous environments
 - with black screw-type terminals for non-hazardous environments

Tasks of the IM 152 interface module

- Connection of ET 200iSP to the intrinsically-safe PROFIBUS DP
- Autonomous communication with the host automation system
- Preparation of data for the fitted electronic modules
- Saving of parameters of the electronic modules
- Time stamping of digital process signals with an accuracy of 20 ms

The maximum address space of the interface module is 244 bytes for inputs, and 244 bytes for outputs.

Technical specifications

Article number	6ES7152-1AA00-0AB0 ET200iSP, IM152-1 INTERFACE MODULE
Input current	
from supply voltage L+, max.	30 mA
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	
Interfaces/bus type	RS 485
Transmission rate, max.	1.5 Mbit/s; 9,6 / 19,2 / 45,45 / 93,75 / 187,5 / 500 kbit/s; 1,5 Mbit/s
Protocols	
PROFIBUS DP	Yes
PROFIBUS DP Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- Direct data exchange (slave-to-slave communication)	Yes; Slave to slave as publisher
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	Yes
Diagnostics function	Yes
Alarms	
• acyclic function, interrupts	Yes
• acyclic function, parameters	Yes
Diagnostics indication LED	
• Bus fault BF (red)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
Potential separation	
between supply voltage and electronics	Yes
Standards, approvals, certificates	
CE mark	Yes
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	I/2 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

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

Interface module

Technical specifications (continued)

Article number	6ES7193-7AA00-0AA0	6ES7193-7AA10-0AA0	6ES7193-7AA20-0AA0	6ES7193-7AB00-0AA0
	ET200iSP, TERM.-MOD. TM-IM/EM60S, SCREW	ET200iSP, TERM.-MOD. TM-IM/EM60C, SPRING	ET200iSP, TERM.-MOD. TM-IM/EM60S	ET200iSP, TERM.-MOD. TM-IM/IM F. TWO IM
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
Use in hazardous areas				
• Type of protection acc. to EN 50020 (CENELEC)	see ET 200iSP system	see ET 200iSP system	No	see ET 200iSP system
• Test number KEMA	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.	235 g	235 g	235 g	195 g

Ordering data

Ordering data	Article No.	Ordering data	Article No.
ET 200iSP interface module IM 152-1	6ES7152-1AA00-0AB0	Accessories	
ET 200iSP terminal module TM-IM/EM60 For an IM 152 and a watchdog, reserve or electronic module (except 2 DO relay), including terminating module		PROFIBUS connector with selectable terminating resistor For connection of IM 152 to PROFIBUS DP with RS 485-iS transmission technology	6ES7972-0DA60-0XA0
• For hazardous environments		RS 485-iS coupler Isolating transformer for connection of PROFIBUS DP segments with RS 485 and RS 485-iS transmission technologies	6ES7972-0AC80-0XA0
- TM-IM/EM60S (blue screw-type terminals)	6ES7193-7AA00-0AA0	Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 152	
- TM-IM/EM60C (blue spring-loaded terminals)	6ES7193-7AA10-0AA0	• petrol	6ES7193-7BH00-0AA0
• For non-hazardous environments		• yellow	6ES7193-7BB00-0AA0
- TM-IM/EM60S (black screw-type terminals)	6ES7193-7AA20-0AA0	Labels, inscribed For slot numbering, label size H x W (in mm): 5 x 7	
ET 200iSP terminal module TM-IM/IM For two IM 152 modules (redundant operation), including terminating module	6ES7193-7AB00-0AA0	• 204 labels, for slots 1 to 20	8WA8361-0AB
		• 204 labels, for slots 1 to 40	8WA8361-0AC
		• 136 labels, inscription in plain text	8WA8348-0XA
		Labels, blank 136 labels for slot numbering, label size H x W (in mm): 5 x 7	8WA8348-2AY
		S7-300 mounting rails	
		• 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box	6ES7390-1AF85-0AA0
		• 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	6ES7390-1AJ85-0AA0

Overview

**Digital input modules**

- 8-channel digital input module DI NAMUR EEx i, for evaluation of NAMUR sensors, connected and non-connected contacts, as well as for use as counter or frequency meter
Parameterizable connections:
 - NAMUR sensor on/off
 - NAMUR changeover contact
 - Single contact connected (mechanical NO contact)
 - Changeover contact connected (mechanical changeover contact)
 - Single contact non-connected (mechanical NO contact with single contact)
 - Changeover contact non-connected (mechanical changeover contact)
 - Counting function: optional use of 2 channels for recording counter pulses or for frequency measurement
 - Short-circuit and wire break monitoring

Digital output modules

- 4-channel digital output modules DO EEx i, 23.1 V DC/20 mA, 17.4 V DC/27 mA, 17.4 V DC/40 mA or 25.5 V DC/22 mA, with external actuator switch-off via High or Low signal (H/L switch-off)
 - Load-free switching of outputs via external intrinsically-safe signal
 - Power boosting through parallel connection of two outputs for one actuator with 4 DO 17.4 V DC/27 mA or 4 DO 17.4 V DC/40 mA
 - Short-circuit and wire break monitoring
- 2-channel digital output module DO Relay EEx e, e.g. for switching solenoid valves, DC contactors or signaling lamps
 - Can be plugged onto TM-RM/RM terminal module
 - Output current up to 2 A with 60 V UC for each of the two relay outputs
 - Installation up to Ex zone 1
 - Intrinsically-safe and non-intrinsically-safe signals can be mixed in a station

Extra functionsActuator shutdown function of the 4 DO EEx i modules

The 4 DO EEx i modules are equipped with a shutdown function. This permits implementation of an external switch-off independent of the automation system (controller).

As soon as the intrinsically-safe switch-off signal (High or Low) is present at the actuator switch-off input of the electronic module, its outputs are deactivated.

You can also combine several DO modules into a switch-off group. The intrinsically-safe power supply for the switch-off device is either via the watchdog module or a separate intrinsically-safe source.

Technical specifications

Article number	6ES7131-7RF00-0AB0 ET200iSP, EL. MOD., 8DI, NAMUR
Input current	
Current consumption, typ.	80 mA
from supply voltage L+, max.	90 mA
Digital inputs	
Number of digital inputs	8
Number of NAMUR inputs	8
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	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	No
Diagnostic messages	
• Diagnostic information readable	Yes
• Short-circuit	Yes; R load < 150 ohms with NAMUR sensor/sensor and NAMUR CO contact/sensor to DIN 19234
Diagnostics indication LED	
• Group error SF (red)	Yes

Article number	6ES7131-7RF00-0AB0 ET200iSP, EL. MOD., 8DI, NAMUR
• Status indicator digital input (green)	Yes
Integrated Functions	
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
Potential separation	
Potential separation digital inputs	
• between the channels	No
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	Yes
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	I/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

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

Digital electronic modules

Technical specifications (continued)

Article number	6ES7132-7RD01-0AB0 ET200iSP, EL. MOD., 4DO, 23.1 V DC, 20MA	6ES7132-7RD11-0AB0 ET200iSP, EL. MOD., 4DO, 17.4 V DC, 27MA	6ES7132-7RD22-0AB0 ET200iSP, EL. MOD., 4DO, 17.4 V DC, 40MA
Input current			
Current consumption, typ.	290 mA	260 mA	380 mA
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	
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)	17.6 V	13.3 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 two outputs			
• for uprating	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		No	
Diagnostics function	Yes	Yes	
Alarms			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages			
• 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
Ex(I) characteristics			
Maximum values of output circuits (per channel)			
• C _o (permissible external capacity), max.			241 nF; For IIC, 1507 nF for IIB
• I _o (short-circuit current), max.			118 mA
• L _o (permissible external inductivity), max.			1.7 mH; For IIC, 10.4 mH for IIB
• P _o (power of load), max.			572 mW
• U _o (output no-load voltage), max.			19.4 V
• T _a (permissible ambient temperature), max.	70 °C	70 °C	

Technical specifications (continued)

Article number	6ES7132-7RD01-0AB0 ET200iSP, EL. MOD., 4DO, 23.1 V DC, 20MA	6ES7132-7RD11-0AB0 ET200iSP, EL. MOD., 4DO, 17.4 V DC, 27MA	6ES7132-7RD22-0AB0 ET200iSP, EL. MOD., 4DO, 17.4 V DC, 40MA	
Potential separation				
Potential separation digital outputs				
• between the channels	No	No	No	
• between the channels and backplane bus	Yes	Yes	Yes	
• Between the channels and load voltage L+	Yes	Yes	Yes	
Standards, approvals, certificates				
CE mark			Yes	
Highest safety class achievable in safety mode				
• SIL acc. 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	
<hr/>				
Article number	6ES7132-7GD00-0AB0 ET200iSP, EL. MOD., 4DO, 23.1 V DC, 20MA	6ES7132-7GD10-0AB0 ET200iSP, EL. MOD., 4DO, 17.4 V DC, 27MA	6ES7132-7GD21-0AB0 ET200iSP, EL. MOD., 4DO, 17.4 V DC, 40MA	6ES7132-7GD30-0AB0 ET200iSP, EL. MOD., 4DO, 25.5 V DC, 22MA
Input current				
Current consumption, typ.	290 mA	260 mA	380 mA	380 mA
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		
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	275 Ω	150 Ω	167 Ω	260 Ω
Trend key points E				
• Voltage U _e (DC)	17.6 V	13.3 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 two outputs				
• for uprating	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

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SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

Digital electronic modules

Technical specifications (continued)

Article number	6ES7132-7GD00-0AB0	6ES7132-7GD10-0AB0	6ES7132-7GD21-0AB0	6ES7132-7GD30-0AB0
	ET200iSP, EL. MOD., 4DO, 23.1 V DC, 20MA	ET200iSP, EL. MOD., 4DO, 17.4 V DC, 27MA	ET200iSP, EL. MOD., 4DO, 17.4 V DC, 40MA	ET200iSP, EL. MOD., 4DO, 25.5 V DC, 22MA
Interrupts/diagnostics/status information				
Status indicator	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages				
• 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 < 800 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
Ex(i) characteristics				
Maximum 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		
Potential separation				
Potential separation digital outputs				
• between the channels	No	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes	Yes
• Between the channels and load voltage L+	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
Highest safety class achievable in safety mode				
• SIL acc. 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

Technical specifications (continued)

Article number	6ES7132-7HB00-0AB0 ET200iSP, RELAY MOD., 2DO, 60 V UC, 2A
Input current	
Current consumption, typ.	100 mA
from load voltage L+ (without load), max.	120 mA
Digital outputs	
Number of digital outputs	2
Short-circuit protection	No
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 two outputs	
• for uprating	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	
- with resistive 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
Alarms	No
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
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

Article number	6ES7132-7HB00-0AB0 ET200iSP, RELAY MOD., 2DO, 60 V UC, 2A
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes; Per channel
Ex(i) characteristics	
Maximum 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
Potential separation	
Potential separation digital outputs	
• between the channels	Yes
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes; Channels and power bus
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• SIL acc. 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.	255 g

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Digital electronic modules

Technical specifications (continued)

Article number	6ES7193-7CA00-0AA0	6ES7193-7CA10-0AA0	6ES7193-7CA20-0AA0	6ES7193-7CB00-0AA0
	ET200iSP, TERM. MOD. TM-EM/EM60S F. EM	ET200iSP, TERM. MOD. TM-EM/EM60C F. EM	ET200iSP, TERM. MOD. TM-EM/EM60S F. EM	ET200iSP, TERM. MOD. TM-RM/RM
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
Use in hazardous areas				
• Type of protection acc. to EN 50020 (CENELEC)	see ET 200iSP system	see ET 200iSP system	No	see ET 200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242		07 ATEX 0205
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.	275 g	275 g	235 g	340 g

Article number	6ES7138-7AA00-0AA0
	ET200iSP, RESERVE MODULE
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)	II2 G EEx ib IIC T4
• Test number KEMA	04 ATEX 1251

Article number	6ES7138-7AA00-0AA0
	ET200iSP, RESERVE MODULE
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	180 g

Ordering data

Article No.

Article No.

Digital input modules

Digital input modules EEx i

8 DI NAMUR

For evaluation of NAMUR sensors, connected/non-connected contacts, as well as for recording counter pulses or measuring frequencies

- 8 x NAMUR (NAMUR sensor on/off, NAMUR changeover contact) or connected/non-connected inputs (single/changeover contact)
- 2 channels optionally usable as counters (max. 5 kHz) or frequency meters (1 Hz ... 5 kHz)
- Time tagging 20 ms, rising or falling edge
- Wire break monitoring
- Short-circuit monitoring
- Sensor power supply monitoring
- Flutter monitoring

Digital output modules

Digital output modules EEx i with H-switch-off

(external actuator switch-off via H-signal); for switching of solenoid valves, DC relays, signal lamps, actuators

4 DO DC 23.1 V/20 mA

- 4 channels with 20 mA each
- Short-circuit monitoring
- Wire break monitoring
- Configurable connection of substitute value in the event of CPU failure
- Load-free switching of outputs via external intrinsically-safe signal

6ES7131-7RF00-0AB0

6ES7132-7RD01-0AB0

4 DO DC 17.4 V/27 mA

- 4 channels with 27 mA each or
- 2 outputs connected in parallel with 54 mA each
- Short-circuit monitoring
- Wire break monitoring
- Configurable connection of substitute value in the event of CPU failure
- Load-free switching of outputs via external intrinsically-safe signal

4 DO DC 17.4 V/40 mA

- 4 channels with 40 mA each or
- 2 outputs connected in parallel with 80 mA each
- Short-circuit monitoring
- Wire break monitoring
- Configurable connection of substitute value in the event of CPU failure
- Load-free switching of outputs via external intrinsically-safe signal

Digital output modules EEx i with L-switch-off

(external actuator switch-off via L-signal); for switching of solenoid valves, DC relays, signal lamps, actuators

4 DO DC 23.1 V/20 mA

- 4 channels with 20 mA each
- Short-circuit monitoring
- Wire break monitoring
- Configurable connection of substitute value in the event of CPU failure
- Load-free switching of outputs via external intrinsically-safe signal

6ES7132-7RD11-0AB0

6ES7132-7RD22-0AB0

6ES7132-7GD00-0AB0

Ordering data	Article No.	Terminal modules	Article No.
4 DO DC 17.4 V/27 mA <ul style="list-style-type: none"> 4 channels with 27 mA each or 2 outputs connected in parallel with 54 mA each Short-circuit monitoring Wire break monitoring Configurable connection of substitute value in the event of CPU failure Load-free switching of outputs via external intrinsically-safe signal 	6ES7132-7GD10-0AB0	ET 200iSP terminal module TM-EM/EM60 For two modules (reserve module, watchdog module and all electronic modules except 2 DO relays can be plugged in) <ul style="list-style-type: none"> For hazardous environments <ul style="list-style-type: none"> TM-EM/EM60S (blue screw-type terminals) For non-hazardous environments <ul style="list-style-type: none"> TM-EM/EM60C (blue spring-loaded terminals) TM-EM/EM60S (black screw-type terminals) 	6ES7193-7CA00-0AA0 6ES7193-7CA10-0AA0 6ES7193-7CA20-0AA0
4 DO DC 17.4 V/40 mA <ul style="list-style-type: none"> 4 channels with 40 mA each or 2 outputs connected in parallel with 80 mA each Short-circuit monitoring Wire break monitoring Configurable connection of substitute value in the event of CPU failure Load-free switching of outputs via external intrinsically-safe signal 	6ES7132-7GD21-0AB0	ET 200iSP terminal module TM-RM/RM 60 For two modules (electronic module 2 DO relays and reserve module can be plugged-in) <ul style="list-style-type: none"> TM-RM/RM60S (screw-type terminals) 	6ES7193-7CB00-0AA0
4 DO DC 25.5 V/22 mA¹⁾ <ul style="list-style-type: none"> 4 channels with 22 mA each Short-circuit monitoring Wire break monitoring Configurable connection of substitute value in the event of CPU failure Load-free switching of outputs via external intrinsically-safe signal 	6ES7132-7GD30-0AB0	Accessories Reserve module For any electronic module	6ES7138-7AA00-0AA0
Digital output modules EEx e For switching of solenoid valves, DC contactors or indicator lights		Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151 <ul style="list-style-type: none"> petrol yellow 	6ES7193-7BH00-0AA0 6ES7193-7BB00-0AA0
2 DO relays, 60 V UC, 2 A <ul style="list-style-type: none"> Can be plugged onto TM-RM/RM terminal module Output current up to 2 A with 60 V UC for each of the two relay outputs Installation up to Ex zone 1 Configurable connection of substitute value in the event of CPU failure 	6ES7132-7HB00-0AB0	Labels, inscribed For slot numbering, label size H x W (in mm): 5 x 7 <ul style="list-style-type: none"> 204 labels, for slots 1 to 20 204 labels, for slots 1 to 40 	8WA8361-0AB 8WA8361-0AC
		Labels, blank 136 labels for slot numbering, label size H x W (in mm): 5 x 7	8WA8348-2AY
		S7-300 rails <ul style="list-style-type: none"> 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box 	6ES7390-1AF85-0AA0 6ES7390-1AJ85-0AA0

¹⁾ Can be used with SIMATIC PCS 7 V7.1+SP2 or higher

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

Analog electronic modules

Overview



Analog input modules

- 4-channel analog input module AI 2 WIRE HART EEx i for current measurement in the range 4 to 20 mA, suitable for connection of two-wire transmitters (with/without HART functionality)
 - Resolution 12 bit + sign
 - Max. load of transmitter 750 Ω
 - Short-circuit and wire break monitoring
- 4-channel analog input module AI 4 WIRE HART EEx i for current measurement in the range 0/4 to 20 mA, suitable for connection of 4-wire transmitters (with/without HART functionality)
 - Resolution 12 bit + sign
 - Max. load of transmitter 750 Ω
 - Wire break monitoring
- 4-channel analog input module AI RTD EEx i for resistance measurement and for temperature measurement per Pt100/Ni100 resistance thermometer
 - Resolution 15 bit + sign
 - 2, 3, or 4-wire connection possible
 - Resistance measurements 600 Ω absolute and 1 000 Ω absolute
 - Wire break monitoring
- 4-channel analog input module AI TC EEx i for thermoelectric EMF measurements and for temperature measurement per thermocouple, type B, E, N, J, K, L, S, R, T, U
 - Resolution 15 bit + sign
 - Internal temperature compensation possible using TC sensor module (included in scope of supply of module)
 - External temperature compensation by means of a temperature value acquired at an analog module of the same ET 200iSP station
 - Wire break monitoring

Analog output modules

- 4-channel analog output module AO I HART EEx i for output of current signals in the range 0/4 to 20 mA to field devices (with/without HART functionality)
 - Resolution 14 bit
 - Parameterizable substitute value in case of CPU failure
 - Short-circuit and wire break monitoring

Extra functions

Temperature compensation

A TC sensor module for internal temperature compensation is provided with the 4 AI TC module, and is fitted on the corresponding terminals of the associated terminal module.

External temperature compensation is possible via a Pt100 on a 4 AI RTD module.

Technical specifications

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
Input current				
Current consumption, typ.	17 mA	19 mA	280 mA	27 mA
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	
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; 66 ms basic conversion time x 4 channels with interference frequency suppression 60 Hz, 80 ms basic conversion time x 4 channels with interference frequency suppression 50 Hz	320 ms; 66 ms basic conversion time x 4 channels with interference frequency suppression 60 Hz, 80 ms basic conversion time x 4 channels with interference frequency suppression 50 Hz	120 ms; 30 ms basic conversion time x4 channels with 60 Hz, 50 Hz interference frequency suppression	120 ms; 30 ms basic conversion time x4 channels with 60 Hz, 50 Hz interference frequency suppression
Technical unit for temperature measurement adjustable	Yes	Yes	Yes	Yes
Input ranges (rated values), voltages				
• -80 mV to +80 mV	Yes			
Input ranges (rated values), currents				
• 4 mA to 20 mA			Yes	Yes
Input ranges (rated values), thermocouples				
• Type B	Yes			
• Type C	Yes			
• Type E	Yes			
• Type J	Yes			
• Type K	Yes			
• Type L	Yes			
• Type N	Yes			
• Type R	Yes			
• Type S	Yes			
• Type T	Yes			
• Type U	Yes			
Input ranges (rated values), resistance thermometer				
• Ni 100		Yes		
• Pt 100		Yes		
Input ranges (rated values), resistors				
• 0 to 600 ohms		Yes; Also 1 000 ohms		
Thermocouple (TC) Temperature compensation				
- internal temperature compensation	Yes; via supplied TC sensor module			
- external temperature compensation with compensations socket	Yes; via temperature value, acquired by an analog module of the same ET 200iSP station			
Characteristic linearization				
• parameterizable	Yes	Yes		
- for thermocouples	Yes			
- for resistance thermometer		Yes		
Cable length				
• shielded, max.	50 m	500 m	500 m	500 m

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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
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				
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	13 bit	12 bit; + sign
• Integration time, parameterizable	Yes	Yes	No	Yes
• Basic conversion time, including integration time (ms)	80 ms at 50 Hz; 66 ms at 60 Hz	80 ms at 50 Hz; 66 ms at 60 Hz		30 ms
- additional conversion time for wire-break monitoring	5 ms	5 ms		
• Interference voltage suppression for interference frequency f_1 in Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Smoothing of measured values				
• parameterizable	Yes; in 4 stages	Yes; in 4 stages	Yes; in 4 stages	Yes; in 4 stages
Encoder				
Connection of signal encoders				
• for current measurement as 2-wire transducer - Burden of 2-wire transmitter, max.			Yes 750 Ω	
• for current measurement as 4-wire transducer				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				
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 range), (+/-)	0.01 %	0.01 %	0.01 %	0.01 %
Operational error limit in overall temperature range				
• Voltage, relative to input range, (+/-)	0.15 %			
• Current, relative to input range, (+/-)			0.15 %	0.15 %
• Resistance thermometer, relative to input range, (+/-)		0.15 %; Applies to resistances standard ± 0.8 K, climatic ± 0.3 K		
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input range, (+/-)	0.1 %			
• Current, relative to input range, (+/-)			0.1 %	0.1 %
• Resistance thermometer, r relative to input range, (+/-)		0.1 %; Applies to resistances standard ± 0.5 K, climatic ± 0.2 K		
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	70 dB
• Common mode interference, min.	90 dB	90 dB		

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
Interrupts/diagnostics/ status information				
Alarms				
• Diagnostic alarm	Yes; Parameterizable	Yes	Yes; Parameterizable	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable	Yes	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages				
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Wire-break		Yes	Yes	Yes
• Short-circuit		Yes	Yes	
• Group error		Yes	Yes	
Diagnostics indication LED				
• Group error SF (red)	Yes	Yes	Yes	Yes
Potential separation				
Potential separation analog inputs				
• between the channels	Yes; Functional	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes	Yes
• Between the channels and 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 ISO 13849-1	none	none	none	none
• SIL acc. 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

Article number	6ES7135-7TD00-0AB0 ET200iSP, EL-MOD., 4 AO, 4-20MA, HART
Input current	
Current consumption, typ.	295 mA
from load voltage L+ (without load), max.	330 mA
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

Article number	6ES7135-7TD00-0AB0 ET200iSP, EL-MOD., 4 AO, 4-20MA, HART
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

I/O Systems

SIMATIC ET 200 systems for the control cabinet
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Analog electronic modules

Technical specifications (continued)

Article number	6ES7135-7TD00-0AB0 ET200iSP, EL-MOD., 4 AO, 4-20MA, HART
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 range), (+/-)	0.01 %
Operational error limit in overall temperature range	
• Current, relative to output range, (+/-)	0.15 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to output range, (+/-)	0.1 %
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

Article number	6ES7135-7TD00-0AB0 ET200iSP, EL-MOD., 4 AO, 4-20MA, HART
Potential separation	
Potential separation analog outputs	
• between the channels	No
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	Yes
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

Article number	6ES7193-7CA00-0AA0 ET200iSP, TERM.-MOD. TM-EM/EM60S F. EM	6ES7193-7CA10-0AA0 ET200iSP, TERM.-MOD. TM-EM/EM60C F. EM	6ES7193-7CA20-0AA0 ET200iSP, TERM.-MOD. TM-EM/EM60S F. EM	6ES7193-7CB00-0AA0 ET200iSP, TERM.-MOD. TM-RM/RM
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
Use in hazardous areas				
• Type of protection acc. to EN 50020 (CENELEC)	see ET 200iSP system	see ET 200iSP system	No	see ET 200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242		07 ATEX 0205
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.	275 g	275 g	235 g	340 g

Article number	6ES7138-7AA00-0AA0 ET200iSP, RESERVE MODULE
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)	II2 G EEx ib IIC T4
• Test number KEMA	04 ATEX 1251

Article number	6ES7138-7AA00-0AA0 ET200iSP, RESERVE MODULE
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	180 g

Ordering data	Article No.	Ordering data	Article No.
Analog input modules		Analog output modules	
Analog input modules EEx i		Analog output modules EEx i	
4 AI 2 WIRE HART For measuring currents with 2-wire transmitters with/without HART functionality <ul style="list-style-type: none"> 4 × 4 ... 20 mA, HART, 2-wire transmitter Transmitter load: max. 750 Ω Resolution 12 bit + sign Short-circuit monitoring Wire break monitoring 	6ES7134-7TD00-0AB0	4 AO HART For output of currents to field devices with/without HART functionality <ul style="list-style-type: none"> 4 × 0/4 ... 20 mA, HART (max. load 750 Ω) Resolution 14-bit Short-circuit monitoring Wire break monitoring Parameterizable substitute value in case of CPU failure 	6ES7135-7TD00-0AB0
4 AI 4 WIRE HART For measuring currents with 4-wire transmitters with/without HART functionality <ul style="list-style-type: none"> 4 × 0/4 ... 20 mA, HART, 4-wire transmitter Transmitter load: max. 750 Ω Resolution 12 bit + sign Wire break monitoring 	6ES7134-7TD50-0AB0	Terminal modules	
4 AI RTD For measuring resistances as well as for temperature measurements with resistance thermometers <ul style="list-style-type: none"> 4 × RTD, resistance thermometer Pt100/Ni100 2, 3, 4-wire Resolution 15 bit + sign Short-circuit monitoring Wire break monitoring 	6ES7134-7SD51-0AB0	ET 200iSP terminal module TM-EM/EM60 For two modules (reserve module, watchdog module and all electronic modules except 2 DQ relays can be plugged in) <ul style="list-style-type: none"> For hazardous environments <ul style="list-style-type: none"> TM-EM/EM60S (blue screw-type terminals) TM-EM/EM60C (blue spring-loaded terminals) For non-hazardous environments <ul style="list-style-type: none"> TM-EM/EM60S (black screw-type terminals) 	6ES7193-7CA00-0AAA 6ES7193-7CA10-0AAA 6ES7193-7CA20-0AAA
4 AI TC For thermoelectric EMF measurements as well as for temperature measurements with thermocouples <ul style="list-style-type: none"> 4 × TC (thermocouples) Type B [PtRh-PtRh] Type N [NiCrSi-NiSi] Type E [NiCr-CuNi] Type R [PtRh-Pt] Type S [PtPh-Pt] Type J [Fe-CuNi] Type L [Fe-CuNi] Type T [Cu-CuNi] Type K [NiCr-Ni] Type U [Cu-CuNi] Resolution 15 bit + sign Internal compensation for the reference junction temperature possible using TC sensor module (included in scope of supply of module) External temperature compensation via Pt100, connected to RTD module of same ET 200iSP station Wire break monitoring 	6ES7134-7SD00-0AB0	Accessories	
		Reserve module For any electronic module	6ES7138-7AA00-0AAA
		Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151 <ul style="list-style-type: none"> petrol yellow 	6ES7193-7BH00-0AAA 6ES7193-7BB00-0AAA
		Labels, inscribed For slot numbering, label size H × W (in mm): 5 × 7 <ul style="list-style-type: none"> 204 labels, for slots 1 to 20 204 labels, for slots 1 to 40 	8WA8361-0AB 8WA8361-0AC
		Labels, blank 136 labels for slot numbering, label size H × W (in mm): 5 × 7	8WA8348-2AY
		S7-300 mounting rails <ul style="list-style-type: none"> 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box 	6ES7390-1AF85-0AAA 6ES7390-1AJ85-0AAA

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

Safety-related electronic modules

Overview



The electronic modules of the SIMATIC ET 200iSP distributed I/O-system equipped with safety functions can be used together with the safety-related automation systems (controllers) for the implementation of safety applications. The input modules record the process signals, evaluate them, and prepare them for additional processing by the automation system. The output modules convert the safety-related signals output by the automation systems so that they are suitable for controlling the connected actuators.

F digital input modules

- 8 F-DI Ex NAMUR
 - Safety-related digital input module for evaluating the signals from IEC 60947-5-6/NAMUR sensors and connected/non-connected mechanical contacts in hazardous and non-hazardous areas
 - SIL3/Cat.3/PLe with 8 inputs (1-channel/1oo1 evaluation) or 4 inputs (2-channel/1oo2 evaluation)
 - 8 short-circuit-proof sensor supplies (8 V DC) for 1 channel each
 - Inputs and sensor supplies electrically isolated from power bus and backplane bus
 - Diagnostics evaluation (deactivated for non-connected mechanical contacts)
 - Internal diagnostics buffer
 - Programmable diagnostics interrupt
 - Supports time stamping
 - Channel-selective passivation
 - Firmware update using HW Config possible
 - Exclusively for safety mode
 - LED displays for safety mode, group errors and channel status/fault

F digital output modules

- 4 F-DO Ex 17.4 V DC/40 mA
 - Safety-related digital output module for controlling actuators in hazardous and non-hazardous areas, e.g. solenoid valves, DC current relays or indicator lamps
 - SIL3/Cat.3/PLe with 4 outputs, P/P-switching
 - Galvanic isolation from power bus and backplane bus
 - Rated load voltage 17.4 V DC
 - Max. output current 40 mA
 - Performance enhancement through parallel connection of two digital outputs for one actuator
 - Short-circuit, overload and wire-break monitoring
 - Configurable diagnostics
 - Internal diagnostics buffer
 - Programmable diagnostics interrupt
 - Channel-selective passivation
 - Firmware update using HW Config possible
 - Exclusively for safety mode
 - LED displays for safety mode, group errors and channel status/fault

F analog input modules

- 4 F-AI Ex HART (0 ... 20 mA or 4 ... 20 mA)
 - Safety-related digital input module for evaluating the signals from current sensors in hazardous and non-hazardous areas, e.g. 2-wire transmitters and HART field devices
 - SIL3/Cat.3/PLe with 4 inputs of one module (1-channel/1oo1 evaluation) or 4 inputs of two modules (2-channel/1oo2 evaluation)
 - Measuring ranges: 0 ... 20 mA or 4 ... 20 mA
 - Resolution 15 bit + sign
 - HART communication in measuring range 4 ... 20 mA
 - 4 short-circuit-proof sensor supplies (min. 12 V DC; max. 26 V DC) for 1 channel each
 - Inputs and sensor supplies electrically isolated from backplane bus
 - Configurable diagnostics
 - Configurable diagnostics interrupt
 - Internal diagnostics buffer
 - Firmware update using HW Config possible
 - Exclusively for safety mode
 - LED displays for safety mode, group errors, channel faults and HART status per channel

Technical specifications

Article number	6ES7138-7FN00-0AB0 ET200iSP, 8F-DI NAMUR EX, FAIL-SAFE
Input current	
Current consumption, typ. from supply voltage L+, max.	145 mA 150 mA; int. Powerbus
Encoder supply	
Number of outputs	8
Type of output voltage	8 V DC
Digital inputs	
Number of digital inputs	8
Number of NAMUR inputs	8
Input current	
• for signal "1", typ.	9.5 mA
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
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	No
Diagnostic messages	
• 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
Potential separation	
Potential separation digital inputs	
• between the channels	No
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. 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 IIIC Da] IIC T4 GB and I M2 Ex ib [ia Ma] I Mb
• Type of protection acc. to KEMA	10 ATEX 0056
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	288 g

Article number	6ES7138-7FD00-0AB0 ET200iSP, 4F-DO 40MA EX, FAIL-SAFE
Input current	
Current consumption, typ. from load voltage L+ (without load), max.	340 mA 510 mA; int. Powerbus
Digital outputs	
Number of digital outputs	4
Short-circuit protection	Yes
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)	10.7 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
Parallel switching of two outputs	
• for uprating	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
Potential separation	
Potential separation digital outputs	
• between the channels	No
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

Safety-related electronic modules

Technical specifications (continued)

Article number	6ES7138-7FD00-0AB0 ET200iSP, 4F-DO 40MA EX, FAIL-SAFE
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. 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 IIIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb
• Type of protection acc. to KEMA	10 ATEX 0057
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	285 g
Article number	6ES7138-7FA00-0AB0 ET200iSP, 4F-AI HART EX, FAIL-SAFE
Input current	
Current consumption, typ. from supply voltage L+, max.	315 mA 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
Analog inputs	
Number of analog inputs	4
Cycle time (all channels) max.	See data in manual
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	500 m
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
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	750 Ω

Article number	6ES7138-7FA00-0AB0 ET200iSP, 4F-AI HART EX, FAIL-SAFE
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.015 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, min.	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.015 %
Operational error limit in overall temperature range	
• Current, relative to input range, (+/-)	0.35 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	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.	50 dB
Interrupts/diagnostics/ status information	
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
Potential separation	
Potential separation analog inputs	
• between the channels	No
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes; Power bus
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. 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 IIIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb
• Type of protection acc. to KEMA	10 ATEX 0058
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	299 g

Technical specifications (continued)

Article number	6ES7138-7AA00-0AA0 ET200iSP, RESERVE MODULE
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)	II2 G EEx ib IIC T4
• Test number KEMA	04 ATEX 1251

Article number	6ES7138-7AA00-0AA0 ET200iSP, RESERVE MODULE
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	180 g

Ordering data

Ordering data	Article No.	Ordering data	Article No.
Safety-related electronic modules		Accessories	
<u>F digital input modules</u>		Reserve module For any electronic module	6ES7138-7AA00-0AA0
8 F-DI Ex NAMUR For evaluating the signals from IEC 60947-5-6/NAMUR sensors and connected/non-connected mechanical contacts in hazardous and non-hazardous areas • SIL3/Cat.3/PLe with 8 inputs (1-channel/1oo1 evaluation) or 4 inputs (2-channel/1oo2 evaluation)	6ES7138-7FN00-0AB0	Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151 • petrol • yellow	6ES7193-7BH00-0AA0 6ES7193-7BB00-0AA0
<u>F digital output modules</u>		Labels, inscribed For slot numbering, label size H x W (in mm): 5 x 7 • 204 labels, for slots 1 to 20 • 204 labels, for slots 1 to 40	8WA8361-0AB 8WA8361-0AC
4 F-DO Ex 17.4 V DC/40 mA For controlling actuators in hazardous and non-hazardous areas, e.g. solenoid valves, DC current relays or indicator lamps • SIL3/Cat.3/PLe with 4 outputs, P/P-switching	6ES7138-7FD00-0AB0	Labels, blank 136 labels for slot numbering, label size H x W (in mm): 5 x 7	8WA8348-2AY
<u>F analog input modules</u>		S7-300 mounting rails • 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box • 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	6ES7390-1AF85-0AA0 6ES7390-1AJ85-0AA0
4 F-AI Ex HART (0 ... 20 mA or 4 ... 20 mA) For evaluating the signals from current sensors in hazardous and non-hazardous areas, e.g. 2-wire transmitters and HART field devices • SIL3/Cat.3/PLe with 4 inputs of one module (1-channel/1oo1 evaluation) or 4 inputs of two modules (2-channel/1oo2 evaluation) • Resolution 15 bit + sign • HART communication in measuring range 4 ... 20 mA	6ES7138-7FA00-0AB0		
Terminal modules			
ET 200iSP terminal module TM-EM/EM60 For two modules (reserve module, watchdog module and all electronic modules except 2 DO relays can be plugged in) • For hazardous environments - TM-EM/EM60S (blue screw-type terminals) - TM-EM/EM60C (blue spring-loaded terminals) • For non-hazardous environments - TM-EM/EM60S (black screw-type terminals)	6ES7193-7CA00-0AA0 6ES7193-7CA10-0AA0 6ES7193-7CA20-0AA0		

I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

Watchdog module

Overview



The watchdog module has two fundamental functions:

- Monitoring of the ET 200iSP remote I/O station for hardware failures (hardware lifebeat); external, applicative failure monitoring is also possible via an I/O address area of the module
- Intrinsically-safe power supply for external actuator switch-off

The watchdog module must be plugged onto a terminal module (order separately). The following terminal modules are suitable for this:

- TM-IM/EM60 terminal modules for one interface module and one watchdog, reserve or electronic module (for versions, see Interface module section)
- TM-EM/EM60 terminal modules with two slots for watchdog module, reserve module or electronic modules (except 2 DO relay):
 - with blue screw-type or spring-loaded terminals for hazardous environments
 - with black screw-type terminals for non-hazardous environments

The first slot directly next to the interface module is provided for the watchdog module.

Technical specifications

Article number	6ES7138-7BB00-0AB0 ET 200iSP, WATCHDOG MOD.
Digital inputs	
Number of digital inputs	0
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm

Ordering data

Article No.

Watchdog module	
Watchdog module For failure monitoring and for the intrinsically-safe power supply of an external actuator switch-off	6ES7138-7BB00-0AB0
Terminal modules	
ET 200iSP terminal module TM-EM/EM60 For two modules (reserve module, watchdog module and all electronic modules except 2 DO relays can be plugged in)	
• For hazardous environments	
- TM-EM/EM60S (blue screw-type terminals)	6ES7193-7CA00-0AAA
- TM-EM/EM60C (blue spring-loaded terminals)	6ES7193-7CA10-0AAA
• For non-hazardous environments	
- TM-EM/EM60S (black screw-type terminals)	6ES7193-7CA20-0AAA
Accessories	
Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151	
• petrol	6ES7193-7BH00-0AAA
• yellow	6ES7193-7BB00-0AAA
Labels, inscribed for slot numbering, label size H × W (in mm): 5 × 7	
• 204 labels, for slots 1 to 20	8WA8361-0AB
• 204 labels, for slots 1 to 40	8WA8361-0AC
Labels, blank 136 labels for slot numbering, label size H × W (in mm): 5 × 7	8WA8348-2AY

Overview

**Tasks of the RS 485-iS coupler**

- Conversion of the electrical PROFIBUS DP RS 485 transmission technology into the intrinsically-safe RS 485-iS transmission technology with a transmission rate of 1.5 Mbps
- Required to connect intrinsically-safe PROFIBUS DP stations, e.g. ET 200iSP or devices from other vendors with Ex i DP connection
- Acts as a safety barrier
- Additional use as a repeater in the hazardous area
- Passive bus station (no configuration necessary)
- 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
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Weight	Approx. 500 g
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Technical data - General

Degree of protection	IP20
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Ambient temperature	- 20 ... + 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

Transmission rate on PROFIBUS DP, PROFIBUS RS 485-iS	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbps 1.5 Mbps
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Bus-Protocol	PROFIBUS DP
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I/O Systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

RS 485-iS coupler

Technical specifications (continued)

Technical specifications - RS 485-iS coupler		
Voltages, Currents, Potentials		
Rated supply voltage of RS 485-iS coupler	24 V DC (20.4 ... 28.8 V)	
• Polarity reversal protection	Yes	
• Voltage drop bypass	Min. 5 ms	
Galvanic isolation of 24 V power supply		
• to PROFIBUS DP	Yes	
- tested with	500 V DC	
• to PROFIBUS RS 485-iS	Yes	
- tested with	AC 500 V	
Current consumption RS 485-iS coupler (24 V DC), max.	150 mA	
Power loss of the module, typically	3 Watts	
Status, alarms, diagnostics		
Status display	no	
Alarms	None	
Diagnostic functions	Yes	
• Bus monitoring PROFIBUS DP (primary)	Yellow LED "DP1"	
• Bus monitoring PROFIBUS RS 485-iS (secondary)	Yellow LED "DP2"	
• Monitoring 24 V power supply	Green LED "ON"	
Technical safety notice		
V_{DC}	±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	AC 250 V	
T_a	-25 ... +60 °C	
RS 485-iS segment		
permitted cable length on a single line	RS 485-iS	DP Ex i
• 9.6 to 187.5 Kbps	1 000 m	200 m
• 500 kbit/s	400 m	200 m
• 1.5 Mbps	200 m	200 m
Number of PROFIBUS DP nodes that can be connected, max.	31	16
PROFIBUS RS 485-iS bus terminator switch	integrated, can be added	

Ordering data

Ordering data	Article No.	Ordering data	Article No.
RS 485-iS coupler Isolating transformer for connection of PROFIBUS DP segments with RS 485 and RS 485-iS transmission systems	6ES7972-0AC80-0XA0	PROFIBUS FastConnect standard cable, violet Standard type with special design for fast mounting, 2-wire, shielded, cut-to-length Specify length in m Max. delivery unit 1 000 m, minimum order quantity 20 m <u>Preferred lengths</u> - 20 m - 50 m - 100 m - 200 m - 500 m - 1 000 m	6XV1830-0EH10
Accessories PROFIBUS connector with selectable terminating resistor For connection of IM 152 to PROFIBUS DP with RS 485-iS transmission technology	6ES7972-0DA60-0XA0	PROFIBUS FastConnect standard cable IS GP, blue Cable type for use in potentially explosive atmospheres, with special design for fast mounting, 2-wire, shielded, cut-to-length Specify length in m Max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-0EN20 6XV1830-0EN50 6XV1830-0ET10 6XV1830-0ET20 6XV1830-0ET50 6XV1830-0EU10
S7-300 rails Lengths: • 160 mm • 482 mm • 530 mm • 830 mm • 2 000 mm	6ES7390-1AB60-0AAA 6ES7390-1AE80-0AAA 6ES7390-1AF30-0AAA 6ES7390-1AJ30-0AAA 6ES7390-1BC00-0AAA		6XV1831-2A

Ordering data	Article No.
Stainless steel enclosure IP65 for SIMATIC ET 200iSP	6DL2804- ■ ■ ■ ■ ■
I/O enclosure	
Surface casing in stainless steel, max. IP66, with mounting plate and equipotential bonding rail, empty enclosure for installation of ET 200iSP components ¹⁾	0
I/O device consisting of surface casing with installed ET 200iSP components ²⁾	1
I/O device consisting of surface casing with installed ET 200iSP and pneumatic components ²⁾	2
I/O device consisting of surface casing with installed ET 200iSP and additional components for zone 2 ³⁾	3
I/O device consisting of surface casing with installed ET 200iSP with pneumatic and additional components for zone 2 ³⁾	4
Device group	
Device group II, up to zone 1 (including zone 2)	A
Device group II, up to zone 2 (not zone 1 and not zone 21)	B
Device group II, up to zone 21 (including zone 22)	D
Device group I M2 (max. degree of protection IP55), for use in mining	M
Enclosure dimensions W x H x D (in mm)	
650 x 450 x 230, for 15 ET 200iSP modules in non-redundant configuration	D
950 x 450 x 230, for 25 ET 200iSP modules in non-redundant configuration	E
800 x 800 x 300, for 2 rows with max. 30 ET 200iSP modules	K
800 x 1000 x 300, for 2 rows with max. 30 ET 200iSP modules	M
1000 x 1000 x 300, for 2 rows with max. 42 ET 200iSP modules	U
1000 x 1200 x 300, for 2 rows with max. 42 ET 200iSP modules	V
Cable entries/number	
6 x M25 for infeed, 6 or 9 x M32 (1 row) for signal lines ⁹⁾	1
6 x M25 for infeed, 12 or 18 x M32 (2 rows) for signal lines ⁹⁾	2
M16 cable entries for signals, 3 rows, 39 or 66 pcs. ⁴⁾ , 2 x M32 for power supply, 4 x M20 for bus cables ⁵⁾	3
M20 cable entries for signals, 3 rows, 36 or 57 pcs. ⁴⁾ , 2 x M32 for power supply, 4 x M20 for bus cables ⁵⁾	4
M16 cable entries for signals, 5 rows, 65 or 110 pcs. ⁴⁾ , 2 x M32 for power supply, 4 x M20 for bus cables ⁵⁾	5
M20 cable entries for signals, 3 rows, 60 or 95 pcs. ⁴⁾ , 2 x M32 for power supply, 4 x M20 for bus cables ⁵⁾	6
Icotek cable entry strip IP65, for up to 45 or 90 signals ⁴⁾ , 2 x M32 for power supply, 4 x M20 for bus cables ⁶⁾	7
Cable entries/material	
Cable entry in plastic, black Ambient operating temperatures: • Surface casing -20...+70 °C • I/O device -20 ... +xx °C ⁵⁾⁷⁾	0
Cable entry in metal (nickel-plated brass) Ambient operating temperatures: • Surface casing -40...+70 °C • I/O device -30 ... +xx °C ⁵⁾⁷⁾⁸⁾	1
Cable entry in plastic, blue Ambient operating temperatures: • Surface casing -20...+70 °C • I/O device -20 ... +xx °C ⁵⁾⁷⁾	2
Icotek cable entry in plastic, gray HN-24 frame Ambient operating temperatures: • Surface casing -40...+70 °C • I/O device -40 ... +xx °C ⁵⁾⁷⁾⁸⁾	3
Cable glands for use in mining	6

- 1) The supplied certificate is only valid for the empty enclosure.
- 2) The included certificate is valid for the supplied enclosure including the installed components.
- 3) The included manufacturer's declaration is valid for the supplied enclosure including the installed components.
- 4) Number of cable entries / signals depending on the enclosure dimensions
- 5) Not for device group I M2
- 6) Installing these components reduces the degree of protection for the enclosure to IP65
- 7) The maximum temperature depends on the installed components.

- 8) Only in conjunction with an installed heater. This takes up 2 slots for ET 200iSP modules. The heater (6DL9910-8AA) must be ordered separately.
- 9) Only for device group I M2, number of signal lines depends on enclosure dimensions

Note:

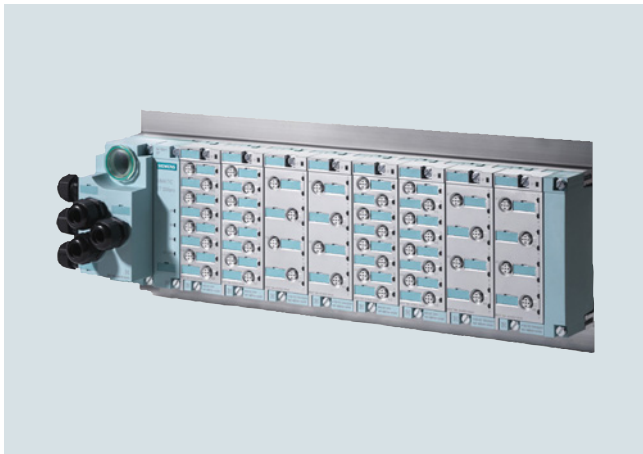
Depending on the cables used, other types and sizes of cable entries can be fitted (on request).

I/O Systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

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 Mbps
- 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
- IO-Link master

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 Mbps (PROFIBUS DP), 100 Mbps (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	
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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

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 ET 200pro, IM 154-1 DP	6ES7154-2AA01-0AB0 ET 200pro, IM154-2 DP HF
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Short-circuit protection	Yes; over exchangeable fuses	Yes; over exchangeable fuses
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from supply voltage 1L+, max.	200 mA	200 mA
Power loss		
Power loss, typ.	5 W	5 W
Address area		
Addressing volume		
• Inputs	244 byte	244 byte
• Outputs	244 byte	244 byte
Interfaces		
Interfaces/bus type	PROFIBUS DP	PROFIBUS DP
Interface types		
RS 485		
• Transmission rate, max.	12 Mbit/s	12 Mbit/s
• automatic detection of transmission rate	Yes	Yes
PROFIBUS DP		
Services		
- SYNC capability	Yes	Yes
- FREEZE capability	Yes	Yes
- Direct data exchange (slave-to-slave communication)	Yes	Yes
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
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 24 V DC (green)	Yes	Yes

I/O Systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Interface modules > IM 154-1 and IM 154-2**Technical specifications** (continued)

Article number	6ES7154-1AA01-0AB0 ET 200pro, IM 154-1 DP	6ES7154-2AA01-0AB0 ET 200pro, IM154-2 DP HF
Parameter		
DPV1 operation	possible	possible
Swapping interrupt	Parameterizable	Parameterizable
Startup if setpoint not equal to actual configuration	Parameterizable	Parameterizable
Hot swapping of modules	possible	possible
Potential separation		
between supply voltage and electronics	Yes	Yes
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Dimensions		
Width	90 mm	90 mm
Height	130 mm	130 mm
Depth	60 mm	60 mm
Weights		
Weight, approx.	375 g	375 g

Ordering data	Article No.		Article No.
IM154-1 interface module For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP.	6ES7154-1AA01-0AB0		
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		
Accessories			
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		
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		
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		
Accessories for CM IM DP ECOFAST			
PROFIBUS ECOFAST hybrid cable, pre-assembled 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:			
1.5 m	6XV1830-7BH15		
3.0 m	6XV1830-7BH30		
5.0 m	6XV1830-7BH50		
10 m	6XV1830-7BN10		
15 m	6XV1830-7BN15		
20 m	6XV1830-7BN20		
PROFIBUS ECOFAST hybrid cable GP, pre-assembled 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:			
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		
		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 , sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1830-7AH10
		PROFIBUS ECOFAST hybrid connector 180 ECOFAST Cu, 2 x Cu, 4 x 1.5 mm ² , HANBRID connector • With male insert, 5-pack • With female insert, 5-pack	6GK1905-0CA00 6GK1905-0CB00
		PROFIBUS ECOFAST hybrid connector angular ECOFAST Cu, 2 x Cu, 4 x 1.5 mm ² , HANBRID connector • With male insert, 5-pack • With female insert, 5-pack	6GK1905-0CC00 6GK1905-0CD00
		Accessories for CM IM DP direct	
		PROFIBUS trailing cable Max. acceleration 4 m/s ² , at least 3 million bending cycles, bending radius at least 60 mm, 2-wire shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1830-3EH10
		PROFIBUS FC Food bus cable With PE sheath for use in the food and beverages industry, 2-wire, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1830-0GH10
		PROFIBUS FC Robust bus cable With PUR sheath for use in environments subject to harsh chemicals and extreme mechanical stress, 2-wire, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1830-0JH10
		Power line 5-wire, 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

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

Interface modules > IM 154-1 and IM 154-2

Ordering data	Article No.	Ordering data	Article No.
Accessories for CM IM DP M12, 7/8"		General accessories	
PROFIBUS M12 connecting cable		ET 200pro rack	
Pre-assembled with two M12 connectors, 5-pin, in various lengths:		<ul style="list-style-type: none"> Narrow, for interface, electronics and power modules <ul style="list-style-type: none"> - 500 mm - 1 000 mm - 2 000 mm, can be cut to length Compact, for interface, electronics and power modules <ul style="list-style-type: none"> - 500 mm - 1 000 mm - 2 000 mm, can be cut to length Wide, for interface, electronics, power modules and motor starters <ul style="list-style-type: none"> - 500 mm - 1 000 mm - 2 000 mm, can be cut to length Wide, for I/O modules and motor starters <ul style="list-style-type: none"> - 500 mm - 1 000 mm - 2 000 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
1.5 m	6XV1830-3DH15	Spare fuse	6ES7194-4HB00-0AA0
2.0 m	6XV1830-3DH20	12.5 A fast-blow, for interface and power modules, 10 units per pack.	
3.0 m	6XV1830-3DH30	PROFIBUS FastConnect bus cable	6XV1830-0EH10
5.0 m	6XV1830-3DH50	Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m.	
10 m	6XV1830-3DN10	PROFIBUS hybrid standard cable GP	6XV1860-2R
15 m	6XV1830-3DN15	Standard PROFIBUS hybrid cable with 2 energy cables (1.5 mm ²) for supplying data and energy for ET 200pro.	
7/8" connecting cable to power supply		SIMATIC Manual Collection	6ES7998-8XC01-8YE0
5-wire, 5 x 1.5 mm ² , trailing type, pre-assembled with two 7/8" connectors, 5-pin, in various lengths:		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).	
1.5 m	6XV1822-5BH15	SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
2.0 m	6XV1822-5BH20	Scope of supply: Current DVD "S7 Manual Collection" and the three subsequent updates.	
3.0 m	6XV1822-5BH30		
5.0 m	6XV1822-5BH50		
10 m	6XV1822-5BN10		
15 m	6XV1822-5BN15		
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 M12 bus termination connector	6GK1905-0EC00		
With male insert.			
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	3RX9802-0AA00		
For protection of unused M12 connections with ET 200pro.			
Sealing cap 7/8"	6ES7194-3JA00-0AA0		
For protection of unused 7/8" connections with ET 200pro; 10 units per pack.			

Overview



Interface module for processing the communication between ET 200pro and a higher-level controller over PROFINET IO.

Technical specifications

Article number	6ES7154-3AB00-0AB0 ET 200pro, IM 154-3 PN HF	6ES7154-4AB10-0AB0 ET 200pro, IM 154-4 PN HF
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Short-circuit protection	Yes; Fuse in lower part is exchangeable, the fuse on the IM-LP is not	Yes; Fuse in lower part is exchangeable, the fuse on the IM-LP is not
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from supply voltage 1L+, max.	300 mA	400 mA; Dependent on terminal module, typ. maximum value for FO connection method, full load on RWB and 20.4 V input voltage
Power loss		
Power loss, typ.	5 W	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
Address area		
Addressing volume		
• Inputs	256 byte	256 byte
• Outputs	256 byte	256 byte
Interfaces		
Interfaces/bus type	PROFINET IO	PROFINET IO
M12 port		
• Autonegotiation	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Protocols (Ethernet)		
• SNMP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

Interface modules > IM 154-3 PN and IM 154-4 PN**Technical specifications** (continued)

Article number	6ES7154-3AB00-0AB0 ET 200pro, IM 154-3 PN HF	6ES7154-4AB10-0AB0 ET 200pro, IM 154-4 PN HF
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
Diagnostics indication LED		
• MAINT LED	Yes	Yes
• LINK LED	Yes	Yes
• RX/TX LED	Yes	Yes
• Bus fault BF (red)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Monitoring 24 V voltage supply ON (green)	Yes	Yes
• Load voltage monitoring 24 V DC (green)	Yes	Yes
Parameter		
Swapping interrupt	Parameterizable	Parameterizable
Startup if setpoint not equal to actual configuration	Parameterizable	Parameterizable
Hot swapping of modules	possible	possible
Potential separation		
between backplane bus and electronics	No	No
between supply voltage and electronics	Yes	Yes
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Dimensions		
Width	90 mm	135 mm
Height	130 mm	130 mm
Depth	60 mm	60 mm
Weights		
Weight, approx.	375 g	490 g

Ordering data	Article No.	Article No.
IM 154-3 PN High Feature interface module For communication between ET 200pro and higher-level controllers via PROFINET IO; supports PROFI-safe. Connection module 6ES7194-4AK00-0AA0 must be ordered separately.	6ES7154-3AB00-0AB0	7/8" sealing caps 1 pack = 10 units 7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm ² , trailing type, pre-assembled 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.
IM 154-4 PN High Feature interface module For communication between ET 200pro and higher-level controllers via PROFINET IO; supports PROFI-safe. Order connection module 6ES7194-4A...00-0AA0 separately.	6ES7154-4AB10-0AB0	6ES7194-3JA00-0AA0 6XV1822-5BH15 6XV1822-5BH20 6XV1822-5BH30 6XV1822-5BH50 6XV1822-5BN10 6XV1822-5BN15 See http://support.automation.siemens.com/WW/view/en/26999294
Accessories Connection modules for IM 154-3 PN High Feature	6ES7194-4AK00-0AA0	Power line 5-wire, 5 x 1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m. 7/8" cable connector For ET 200eco, with axial cable outlet. • With male insert, 5-pack • With female insert, 5-pack
Connection module CM IM PN M12, 7/8" S for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8"	6ES7194-4AJ00-0AA0	Industrial Ethernet FastConnect installation cables • 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 1 000 m; minimum order quantity 20 m. • IE FC TP trailing cable GP 2 x 2; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m. • IE TP torsion Cable GP 2 x 2; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m. • IE FC TP marine cable 2 x 2; Sold by the meter, max. order quantity 1 000 m; minimum order quantity 20 m.
Connection modules for IM 154-4 PN High Feature	6ES7194-4AF00-0AA0	6XV1840-2AH10
Connection module CM IM PN 2xRJ45 for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x RJ45 and 2 x push-pull power connector	6ES7194-4AG00-0AA0	6XV1840-3AH10
Connection module CM IM PN 2xSCRJ FO for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x SCRJ FO and 2 x push-pull power connector	6ES7194-4AG00-0AA0	6XV1870-2D
M12 sealing cap For protection of unused M12 connections with ET 200pro.	3RX9802-0AA00	6XV1870-2F
IE M12 connecting cables Pre-assembled with two M12 connectors, up to 85 m, 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 m 15 m Other special lengths with 90° or 180° cable outlet.	6XV1870-8AE30 6XV1870-8AE50 6XV1870-8AH10 6XV1870-8AH15 6XV1870-8AH20 6XV1870-8AH30 6XV1870-8AH50 6XV1870-8AN10 6XV1870-8AN15 See http://support.automation.siemens.com/WW/view/en/26999294	6XV1840-4AH10

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

Interface modules > IM 154-3 PN and IM 154-4 PN

Ordering data	Article No.	Ordering data	Article No.
IE RJ45 plug PRO RJ45 plug connector in IP65/67-rated design for on-site assembly, plastic housing, insulation/displacement connection system, for SCALANCE X-200 IRT PRO and ET 200pro: 1 pack = 1 unit.	6GK1901-1BB10-6AA0	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 1 000 mm 2 000 mm, can be cut to length Compact, for interface, electronics and power modules <ul style="list-style-type: none"> 500 mm 1 000 mm 2 000 mm, can be cut to length Wide, for interface, electronics, power modules and motor starters <ul style="list-style-type: none"> 500 mm 1 000 mm 2 000 mm, can be cut to length Wide, for I/O modules and motor starters <ul style="list-style-type: none"> 500 mm 1 000 mm 2 000 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
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-200 IRT PRO and ET 200pro 1 pack = 1 unit	6GK1900-0MB00-6AA0		
IE SC RJ PCF plug PRO SC RJ plug for PCF fibers in IP65/67-rated design for on-site assembly, plastic housing, for SCALANCE X-200 IRT PRO 1 pack = 1 unit.	6GK1900-0NB00-6AA0		
Power plug PRO 5-pole power plug for 2 x 24 V power supply in IP65/67-rated design, for on-site assembly, plastic housing, for SCALANCE X-200 IRT and ET 200 pro 1 pack = 1 unit.	6GK1907-0AB11-6AA0	Spare fuse 12.5 A fast-blow, for interface and power modules, 10 units per pack.	6ES7194-4HB00-0AA0
IE panel feed-through Control cabinet feed-through for converting M12 D-coded connection system (IP65) to RJ45 connection system (IP20) <ul style="list-style-type: none"> 1 pack = 5 units 	6GK1901-0DM20-2AA5	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
Push-pull cable connector For 1L+/ 2L+, unassembled	6GK1907-0AB11-6AA0		
Cover caps for push-pull RJ45 female connectors 5 items per pack	6ES7194-4JD50-0AA0		
Cover caps for push-pull female connectors power (1L+, 2L+) 5 units	6ES7194-4JA50-0AA0	SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	6ES7998-8XC01-8YE2

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 8 DI and 8 DO 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	6ES7141-4BF00-0AB0	6ES7141-4BH00-0AA0
	ET 200pro, EM 8DI 24V DC	ET 200pro, EM 8DI 24V DC HF	ET 200pro, EM 16DI 24V DC
Supply voltage			
Rated value (DC)	24 V	24 V	24 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 supply voltage 1L+, max.	20 mA	40 mA	30 mA
from backplane bus 3.3 V DC, max.	20 mA	20 mA	20 mA
Encoder supply			
Number of outputs	8	8	8
Short-circuit protection	Yes; per module, electronic	Yes; per channel, electronic	Yes; per module, electronic
Output current			
• up to 55 °C, max.	1 A	1 A	1 A
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			
• 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
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

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

I/O modules > Digital expansion modules

Technical specifications (continued)

Article number	6ES7141-4BF00-0AA0 ET 200pro, EM 8DI 24V DC	6ES7141-4BF00-0AB0 ET 200pro, EM 8DI 24V DC HF	6ES7141-4BH00-0AA0 ET 200pro, EM 16DI 24V DC
Interrupts/diagnostics/ status information			
Diagnostics function	Yes	Yes; channel by channel, parameterizable	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnostic messages			
• Diagnostic information readable	Yes	Yes	Yes
• Wire-break		Yes; Monitoring, I < 0.3 mA; per channel	
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; channel by channel	Yes; Sensor supply to M; module by module
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital input (green)	Yes; Per channel	Yes; Per channel	Yes; Per channel
Potential separation			
between backplane bus and all other circuit components	Yes	Yes	Yes
Potential separation digital inputs			
• between the channels	No	No	No
• between the channels and backplane bus	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 ET 200pro, EM 4DO 24V DC/2.0A	6ES7142-4BD00-0AB0 ET 200pro, EM 4DO 24VDC/2.0A HF	6ES7142-4BF00-0AA0 ET 200pro, EM 8DO 24VDC/0.5A
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	30 mA	30 mA
Digital outputs			
Number of digital outputs	4	4	8
Short-circuit protection	Yes	Yes	Yes
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 two outputs			
• for uprating	No	No	No
• for redundant control of a load	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7142-4BD00-0AA0 ET 200pro, EM 4DO 24V DC/2.0A	6ES7142-4BD00-0AB0 ET 200pro, EM 4DO 24VDC/2.0A HF	6ES7142-4BF00-0AA0 ET 200pro, EM 8DO 24VDC/0.5A
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
Total current of the 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			
Diagnostics function	Yes	Yes	Yes
Substitute values connectable		Yes	
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnostic messages			
• Diagnostic information readable	Yes	Yes	Yes
• Wire-break		Yes; channel by channel	
• Short-circuit	Yes; Short-circuit of outputs to ground; module by module	Yes; channel by channel	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 fault indicator F (red)		Yes	
Potential separation			
between backplane bus and all other circuit components	Yes	Yes	Yes
Potential separation digital outputs			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for safety-related tripping of standard modules	Yes	Yes	Yes
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2
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

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

I/O modules > Digital expansion modules

Technical specifications (continued)

Article number	6ES7143-4BF50-0AA0 ET 200pro, EM 4DI / 4DO 24V DC, 0.5A	6ES7143-4BF00-0AA0 ET 200pro, EM 4 DIO / 4 DO 24V DC, 0.5A
Supply voltage		
Rated value (DC)		24 V
Reverse polarity protection		Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Short-circuit protection	Yes	Yes
• Reverse polarity protection	Yes	Yes; against destruction; load increasing
Input current		
from supply voltage 1L+, max.		20 mA
from load voltage 2L+ (without load), max.	20 mA	20 mA
from backplane bus 3.3 V DC, max.	20 mA	30 mA
Encoder supply		
Number of outputs	4	4
Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic
Output current		
• up to 55 °C, max.	1 A	1 A
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 55 °C, max.		4
Input voltage		
• 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 "1", typ.	7 mA	7 mA
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
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
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ
Output voltage		
• for signal "1", min.		2L+ (-0,8 V)
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 two outputs		
• for uprating	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

Technical specifications (continued)

Article number	6ES7143-4BF50-0AA0 ET 200pro, EM 4DI / 4DO 24V DC, 0.5A	6ES7143-4BF00-0AA0 ET 200pro, EM 4 DIO / 4 DO 24V DC, 0.5A
Total current of the outputs (per group)		
all mounting positions		
- up to 55 °C, max.	2 A	2 A
Cable length		
• unshielded, max.	30 m	30 m
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• 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
Diagnostics indication LED		
• Group error SF (red)		Yes
• Status indicator digital input (green)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
Potential separation		
between backplane bus and all other circuit components	Yes	Yes
Potential separation digital inputs		
• between the channels	No	No
• between the channels and backplane bus	Yes	Yes
Potential separation digital outputs		
• between the channels	No	
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules		Yes
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1		PL d
• Category according to ISO 13849-1		Cat. 3
• SILCL according to IEC 62061		SILCL 2
Dimensions		
Width	45 mm	45 mm
Height	130 mm	130 mm
Depth	35 mm	35 mm
Weights		
Weight, approx.	140 g	140 g

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

I/O modules > Digital expansion modules

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 M12 sockets 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 or 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 M23 socket; 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
		M12 Y circular connector For double connection of sensors via a single cable, 5-pole; cannot be used for F DI 4/8	6ES7194-1KA01-0XA0
		M12 Y cable For double connection of I/O by means of a single-cable on ET 200, 5-pole	6ES7194-6KA00-0XA0
		M8 sealing cap For IP67 modules	3RK1901-1PN00

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
	ET 200pro, EM 4AI-U HF	ET 200pro, EM 4AI-I HF	ET 200pro, EM 4 AI-RTD HF	ET 200pro, EM 4 AI-TC HF
Supply voltage				
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 supply voltage 1L+, max.	40 mA; Typical	40 mA; Typical	27 mA; Typical	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				
Number of outputs	4	4		
Short-circuit protection	Yes; per module, electronic to frame	Yes; per module, electronic to frame		
Output current				
• up to 55 °C, max.	1 A	1 A		
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; Degrees Celsius/degrees Fahrenheit	Yes; °C/°F/K
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 ranges (rated values), currents				
• 0 to 20 mA		Yes		
• -20 mA to +20 mA		Yes		
• 4 mA to 20 mA		Yes		

I/O Systems

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SIMATIC ET 200pro

I/O modules > Analog expansion modules

Technical specifications (continued)

Article number	6ES7144-4FF01-0AB0 ET 200pro, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET 200pro, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET 200pro, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET 200pro, EM 4 AI-TC HF
Input ranges (rated values), thermocouples				
<ul style="list-style-type: none"> Type B Type E Type J Type K Type L Type N Type R Type S Type T 				Yes Yes Yes Yes Yes Yes Yes Yes Yes
Input ranges (rated values), resistance thermometer				
<ul style="list-style-type: none"> Cu 10 Ni 100 Ni 1000 Ni 120 Ni 200 Ni 500 Pt 100 Pt 1000 Pt 200 Pt 500 			No Yes Yes Yes Yes Yes Yes Yes Yes Yes	
Input ranges (rated values), resistors				
<ul style="list-style-type: none"> 0 to 150 ohms 0 to 300 ohms 0 to 600 ohms 0 to 3000 ohms 			Yes Yes Yes Yes	
Thermocouple (TC)				
Temperature compensation				
<ul style="list-style-type: none"> internal temperature compensation external temperature compensation with compensations socket 				Yes Yes
Characteristic linearization				
<ul style="list-style-type: none"> parameterizable for resistance thermometer 			Yes Ptxxx, Nixxx	
Cable length				
<ul style="list-style-type: none"> shielded, max. 	30 m	30 m	30 m	30 m
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 bit + sign at ±10 V, at ±5 V; 15 bit 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 bit + sign at ±10 V, at ±5 V; 15 bit 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 	Yes	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7144-4FF01-0AB0 ET 200pro, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET 200pro, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET 200pro, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET 200pro, EM 4 AI-TC HF
Encoder				
Connection of signal encoders				
<ul style="list-style-type: none"> • for voltage measurement • 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	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 range), (+/-)	0.004 %	0.004 %	0.015 %	0.01 %
Operational error limit in overall temperature range				
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance thermometer, relative to input range, (+/-) 	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 range, (+/-) • Current, relative to input range, (+/-) • Resistance thermometer, relative to input range, (+/-) 	0.075 %	0.075 %	0.125 %	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 (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 interference (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				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
<ul style="list-style-type: none"> • Diagnostic alarm • Hardware interrupt 	Yes; Parameterizable Yes; (limit value alarm), can be parameterized for channel 0	Yes; Parameterizable Yes; (limit value alarm), can be parameterized for channel 0	Yes; Parameterizable No	Yes; Parameterizable No
Diagnostic messages				
<ul style="list-style-type: none"> • Diagnostic information readable • Wire-break • Short-circuit • Overflow/underflow 	Yes Yes; at 1 to 5 V Yes; at 1 to 5 V	Yes Yes; at 4 to 20 mA Yes; at 4 to 20 mA	Yes Yes	Yes Yes
Diagnostics indication LED				
<ul style="list-style-type: none"> • Group error SF (red) 	Yes	Yes	Yes	Yes

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

I/O modules > Analog expansion modules

Technical specifications (continued)

Article number	6ES7144-4FF01-0AB0 ET 200pro, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET 200pro, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET 200pro, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET 200pro, EM 4 AI-TC HF
Parameter				
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)
Comparison point				None/internal/RTD(0)/dyn. ref. temp./fix. ref. temp.
Potential separation				
Potential separation analog inputs				
• between the channels	No	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for applications according to AMS 2750				Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9				Yes; Based on AMS 2750 E
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 ET 200pro, EM 4AO-U HF	6ES7145-4GF00-0AB0 ET 200pro, EM 4 AO-I HF
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from supply voltage 1L+, max.	65 mA	110 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA
Actuator supply		
Number of outputs	4	4
Short-circuit protection	Yes; per module	Yes; per module
Output current		
• up to 55 °C, max.	1 A	1 A
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

Technical specifications (continued)

Article number	6ES7145-4FF00-0AB0 ET 200pro, EM 4AO-U HF	6ES7145-4GF00-0AB0 ET 200pro, 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 Ω	
• with voltage outputs, capacitive load, max.	1 μF	
• with current outputs, max.		600 Ω
• with current outputs, inductive load, max.		1 mH
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 bit at 1 to 5 V; 15 bit at 0 to 10 V	15 bit; at ±20 mA; 14 bit at 0 to 20 mA; 15 bit at 4 to 20 mA
• Conversion time (per channel)	0.7 ms	0.7 ms
Settling time		
• for resistive load	0.1 ms	0.1 ms
• for capacitive load	6 ms	
• for inductive load		1 ms
Errors/accuracies		
Output ripple (relative to output range, 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 range), (+/-)	0.05 %	0.05 %
Operational error limit in overall temperature range		
• Voltage, relative to output range, (+/-)	0.2 %	
• Current, relative to output range, (+/-)		0.2 %
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to output range, (+/-)	0.15 %	
• Current, relative to output range, (+/-)		0.15 %
Interrupts/diagnostics/status information		
Diagnostics function		Yes
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	No	No
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Wire-break	No	Yes; per channel, not in zero range
• Short-circuit	Yes; per channel, not in zero range	No
Diagnostics indication LED		
• Group error SF (red)	Yes	Yes

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

I/O modules > Analog expansion modules

Technical specifications (continued)

Article number	6ES7145-4FF00-0AB0	6ES7145-4GF00-0AB0
	ET 200pro, EM 4AO-U HF	ET 200pro, EM 4 AO-I HF
Potential separation		
Potential separation analog outputs		
• between the channels	No	No
• between the channels and 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

Ordering data

Article No.

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	Accessories	
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	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-specific 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-specific 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
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		

Overview

- 45 mm wide 4 IO-LINK HF electronic module
- 4 IO-Link ports according to IO-Link specification V1.1
- Port Class B
- The IO-Link parameters are configured using the Port Configuration Tool (S7-PCT), version V3.4 and higher

Technical specifications

Article number	6ES7147-4JD00-0AB0 ET200pro, EM 4 IO-Link HF
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Load voltage 2L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction; load increasing
Input current	
from supply voltage 1L+, max.	40 mA
from load voltage 2L+ (without load), max.	20 mA
from backplane bus 3.3 V DC, max.	20 mA
Encoder supply	
Number of outputs	4
Short-circuit protection	Yes; per module, electronic
Output current	
• up to 55 °C, max.	2 A
Power loss	
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), 230.4 kBaud (COM3)
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
Master backup	Possible with function block IO_LINK_MASTER
Configuration without S7-PCT	Possible; autostart/manual function
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: for X1 and X2 max. 2 A in total, for X3 and X4 max. 2 A in total

Article number	6ES7147-4JD00-0AB0 ET200pro, EM 4 IO-Link HF
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
• Wire-break	Yes; channel by channel
• Short-circuit	Yes; channel by channel
Diagnostics indication LED	
• Channel status display	Yes; One green LED for channel status Qn (SIO mode) and port status IO-Ln (IO-Link mode)
• Group error SF (red)	Yes
• Channel fault indicator F (red)	Yes; combined with the IO-Link port status
Potential separation	
between the load voltages	Yes
between backplane bus and all other circuit components	Yes
Potential separation channels	
• between the channels	No
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	No
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	150 g

Ordering data**Article No.**

4 IO-LINK HF electronic module	6ES7147-4JD00-0AB0
4 IO-Link ports according to IO-Link specification V1.1, port Class B; High Feature, channel diagnostics, including bus module. Connection module must be ordered separately	
Accessories	
CM IO-Link 4 x M12 P connection module	6ES7194-4CA20-0AA0
4 M12 sockets for connecting IO-Link devices to ET 200pro electronic module 4 IO-LINK HF	
Module identification labels	6ES7194-4HA00-0AA0
For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	
M12 sealing cap	3RX9802-0AA00
For protection of unused M12 connections with ET 200pro	

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

I/O modules > Fail-safe digital expansion modules

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, Elec. module, 8/16 F-DI 24V DC
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Digital inputs	
Number of digital inputs	16
Input current	
• for signal *1*, typ.	3.7 mA
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	e
• SIL acc. to IEC 61508	3
Dimensions	
Width	90 mm
Height	130 mm
Depth	65 mm

Article number	6ES7148-4FC00-0AB0 ET200PRO, Elec. module, 4/8 F-DI/4 F-DO 24VDC/2A	6ES7148-4FS00-0AB0 ET200PRO, Elec. module, F-Switch PROFIsafe
Supply voltage		
Rated value (DC)	24 V	24 V
Digital inputs		
Number of digital inputs	8	2
Input current		
• for signal *1*, typ.	3.7 mA	3.5 mA
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

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

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

I/O modules > PM-E power module

Overview



PM-E 24 V DC power module

Technical specifications

Article number	6ES7148-4CA00-0AA0 ET 200pro, PM-E 24V DC
Supply voltage	
Load voltage 2L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes; via an exchangeable fuse in the power module
• Reverse polarity protection	Yes; against destruction
Input current	
from load voltage 2L+, max.	3 mA
Current carrying capacity	
max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)
Power loss	
Power loss, typ.	0.1 W
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
• missing load voltage	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Load voltage monitoring 24 V DC (green)	Yes

Article number	6ES7148-4CA00-0AA0 ET 200pro, PM-E 24V DC
Parameter	
missing load voltage	Potential group of the power module
Potential separation	
between load voltage and backplane bus	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	140 g

Ordering data	Article No.	Article No.	
PM-E 24 V DC power module For backfeed and group formation of the 24 V DC load voltage for electronic modules within an ET 200pro station.	6ES7148-4CA00-0AA0	ECOFAST cable connector, for user assembly Female connector; ordering unit 5 items	6GK1905-0CB00
Accessories		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 ECOFAST connecting module For backfeed of 24 V load voltage, 1 ECOFAST Cu connection	6ES7194-4BA00-0AA0	Push-pull cable connector For 1L+/ 2L+, unassembled	6GK1907-0AB11-6AA0
CM PM-E direct connecting module For backfeed of 24 V load voltage, up to 2 M20 screwed cable glands	6ES7194-4BC00-0AA0	Cover caps for push-pull female connectors 5 units	6ES7194-4JA50-0AA0
CM PM-E 7/8" connecting module For backfeed of 24 V load voltage, 1 x 7/8"	6ES7194-4BD00-0AA0	Accessories for CM PM-E direct	
CM PM-E PP connection module For supplying 24 V load voltage, 2 x push-pull, with spare fuse	6ES7194-4BE00-0AA0	Power line 5-wire, 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
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 7/8"	
PROFIBUS ECOFAST hybrid cable, copper Trailing-type cable (PUR sheath), with two shielded Cu wires for PROFIBUS DP plus four Cu wires of 1.5 mm ² , sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m Preassembled with ECOFAST male and female connector, fixed length <ul style="list-style-type: none"> • 1.5 m • 3 m • 5 m • 10 m • 15 m • 20 m 	6XV1830-7AH10 6XV1830-7BH15 6XV1830-7BH30 6XV1830-7BH50 6XV1830-7BN10 6XV1830-7BN15 6XV1830-7BN20	7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm ² , trailing type, preassembled with two 7/8" connectors, 5-pin <ul style="list-style-type: none"> • 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
PROFIBUS ECOFAST hybrid cable, GP Trailing-type cable with 4 x copper cores and 2 x copper cores, shielded, with UL approval Preassembled with ECOFAST male and female connector <ul style="list-style-type: none"> • 1.5 m • 3 m • 5 m • 10 m • 15 m • 20 m 	6XV1860-3PH15 6XV1860-3PH30 6XV1860-3PH50 6XV1860-3PN10 6XV1860-3PN15 6XV1860-3PN20	7/8" cable connector With axial cable outlet <ul style="list-style-type: none"> • with female insert, 5 per pack 	6GK1905-0FB00

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

I/O modules > PM-O power module output

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 2x24V DC
Supply voltage	
Load voltage 2L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
Input current	
from load voltage 2L+, max.	3 mA
Current carrying capacity	
max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)
Power loss	
Power loss, typ.	1.1 W
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
• missing load voltage	No
Diagnostics indication LED	
• Group error SF (red)	Yes
• Load voltage monitoring 24 V DC (green)	No; Signalled in IM or in PM

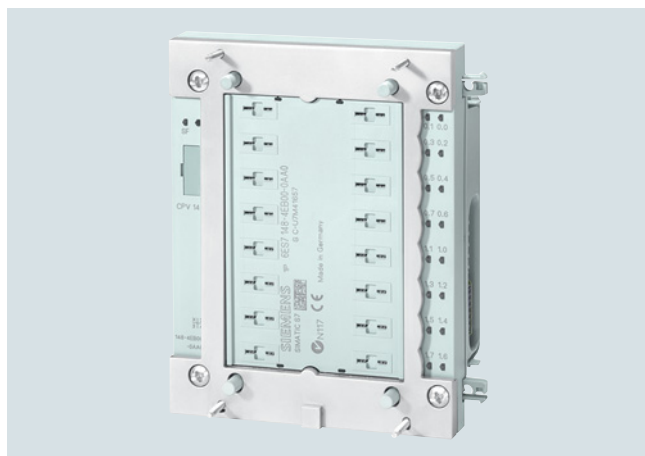
Article number	6ES7148-4CA60-0AA0
	ET200PRO, PM-O 2x24V DC
Parameter	
Diagnostics short-circuit	Diagnosis short circuit implemented after M for 1L+
Potential separation	
between load voltage and backplane bus	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	150 g

Ordering data

	Article No.
PM-O 2 x 24 V DC power module	6ES7148-4CA60-0AA0
For drawing the 24 V load voltage 2L+ and electronic/encoder supply voltage 1L+ within an ET 200pro station.	

	Article No.
Accessories	
CM PM-O PP connection module	6ES7194-4BH00-0AA0
For drawing the 24 V load voltage and electronic/encoder supply voltage, 2 x push-pull connector	
Push-pull cable connector	6GK1907-0AB11-6AA0
For 1L+/ 2L+, unassembled	
Cover caps for push-pull female connectors	6ES7194-4JA50-0AA0
5 units	

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
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+, max.	300 mA; Including valves	370 mA; Including valves
from backplane bus 3.3 V DC, max.	25 mA	25 mA
Power loss		
Power loss, typ.	2.6 W	3.7 W
Address area		
Address space per module		
• Address space per module, max.	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
Total current of the 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
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
Diagnostics indication LED		
• Group error SF (red)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes

I/O SystemsSIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro**I/O modules > ET 200pro pneumatic interface****Technical specifications** (continued)

Article number	6ES7148-4EA00-0AA0 ET200PRO, 16DO, Pneumatic Interface CPV10	6ES7148-4EB00-0AA0 ET200PRO, 16DO, Pneumatic Interface CPV14
Pneumatics		
Number of connectable valves, max.	16	16
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
Parameter		
Remark	Diagnosis load voltage 2L+	Diagnosis load voltage 2L+
Response to CPU/master STOP	No	
Potential separation		
between backplane bus and all other circuit components	Yes	Yes
Potential separation digital outputs		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes	Yes
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2
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

DO 16 x P/CPV 14 for direct accommodation of FESTO valve terminal CPV 14 16 DO x P

Article No.**6ES7148-4EA00-0AA0****6ES7148-4EB00-0AA0****Article No.**

FESTO CPV 10 valve terminal

FESTO CPV 14 valve terminal

available from FESTO

available from FESTO

FESTO AG & Co
Ruitersstr. 82
D-73732 EsslingenMore addresses
on the Internet at:
<http://www.festo.de>

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 optical reader devices and MV300 optical handheld readers can be operated on the RF170C. In addition, the RF170C provides a universal RS 232/ RS 422 interface for connecting devices using the Freeprot protocol.

Thanks to the 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 it to be used in all applications. The uniform plug-in connection system ensures rapid commissioning.

Technical specifications

Article number	6GT2002-0HD01
Product type designation	RF170C communication module
Suitability for operation	ET200pro distributed I/O together with RF200/300/600, MV300/400, MOBY D/E/I/U and RS232 devices
Transmission rate	
Transfer rate at the point-to-point connection serial maximum	115.2 kbit/s
Interfaces	
Design of the interface for point-to-point connection	RS422/RS232 via connection block
Number of readers connectable	2
Type of electrical connection	
• of the backplane bus	ET 200pro backplane bus
• of the PROFIBUS interface	(according to the head module)
• of Industrial Ethernet interface	(according to the head module)
• for supply voltage	ET 200pro backplane bus
Design 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 the screw for securing the equipment maximum	1.5 N·m
Supply voltage, current consumption, power loss	
Supply voltage	
• at DC Rated value	24 V
• at DC	20 ... 30 V
Consumed current at DC at 24 V	
• without connected devices typical	0.13 A
• with connected devices maximum	1 A

Article number	6GT2002-0HD01
Product type designation	RF170C communication module
Permitted ambient conditions	
Ambient temperature	
• during operation	-25 ... +55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Protection class IP	IP67
Shock resistance	According to IEC 61131-2
Shock acceleration	300 m/s ²
Vibrational acceleration	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
Wire length for RS 422 interface maximum	1 000 m
Product properties, functions, components general	
Display version	(see connection block)
Product function transponder file handler can be addressed	No
Protocol is supported	
• S7 communication	Yes
Type of parameterization	HSP
Type of programming	FB 45, FB 55, ID profile, library with functions, (FC 45/55 with restricted functionality)
Type of computer-mediated communication	acyclic communication
Standards, specifications, approvals	
Certificate of suitability	CE, FCC, cULus
MTBF	77 y
Accessories	
accessories	Connection block for RF170C

I/O Systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > RF170C

Ordering data	Article No.		Article No.	
SIMATIC RF170C communication module For connecting to the ET 200pro distributed I/O system	6GT2002-0HD01		MOBY D reader cable PUR material, suitable for cable carriers, 2 m.	6GT2691-4FH20
Accessories				
Connection block for SIMATIC RF170C For connecting 2 readers or other RS 422/RS 232 devices via an M12 connector	6GT2002-1HD01		Reader cable for MV300 handheld readers Coiled cable with usable length of 1.6 m to 4 m for MV320, PUR material	6GT2191-0BH50
			Coiled cable with usable length of 1.6 m to 4 m for MV340, PUR material	6GT2191-0AH50
Reader cable for SIMATIC RF200 / RF300 / RF600 / MV440 Or MOBY D extension cable and SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, suitable for cable carriers			Connector for connection of other RS 422/RS 232 devices 8-pin M12 connector, male, screw contacts for wires up to 0.5 mm ² . Order quantity 1 pack with 5 units	6GT2090-0BE00
2 m, straight connector	6GT2891-4FH20		M12 sealing caps for unused reader connections Minimum order quantity 10 units, price per 100 units	3RX9802-0AA00
5 m, straight connector	6GT2891-4FH50			
10 m, straight connector	6GT2891-4FN10			
20 m, straight connector	6GT2891-4FN20			
50 m, straight connector	6GT2891-4FN50			
2 m, connector angled at reader	6GT2891-4JH20		DVD "RFID Systems Software & Documentation"	6GT2080-2AA20
5 m, connector angled at reader	6GT2891-4JH50			
10 m, connector angled at reader	6GT2891-4JN10			

Overview

**Power supply for ET200pro:**

- 3-phase, 24 V DC/8 A

The SIMATIC ET200pro 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 ET200pro PS
Power supply, type	24 V/8 A
Input	
Input	3-phase AC
Rated voltage value $V_{in \text{ rated}}$	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 $I_{out \text{ rated}}$, min.	15 ms; at $V_{in} = 400 \text{ V}$
Rated line frequency 1	50 Hz
Rated line frequency 2	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)
Output	
Output	Controlled, isolated DC voltage
Rated voltage $V_{out \text{ DC}}$	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)

Article number	6ES7148-4PC00-0HA0
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
On/off behavior	Overshoot of $V_{out} < 2 \%$
Startup delay, max.	1.5 s
Voltage rise, typ.	40 ms
Rated current value $I_{out \text{ rated}}$	8 A
Current range	0 ... 8 A
Supplied active power 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
Efficiency	
Efficiency at $V_{out \text{ rated}}$, $I_{out \text{ rated}}$, approx.	88 %
Power loss at $V_{out \text{ rated}}$, $I_{out \text{ rated}}$, approx.	25 W
Closed-loop control	
Dynamic mains compensation ($V_{in \text{ rated}} \pm 15 \%$), max.	0.5 %
Dynamic load smoothing ($I_{out}: 50/100/50 \%$), $U_{out} \pm \text{typ.}$	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	
Short-circuit protection	Electronic shutdown, automatic restart
Enduring short circuit current RMS value	
• maximum	10 A
Overload/short-circuit indicator	-

I/O SystemsSIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro**Power supplies > 3-phase, 24 V DC (ET200pro PS, IP67)****Technical specifications** (continued)

Article number	6ES7148-4PC00-0HA0
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
Safety	
Primary/secondary isolation (galvanic isolation)	Yes Protective extra low output voltage Vout 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/cUL (CSA) approval	UL-Listed (UL 508) according to NFPA compatibility (National Fire Protection Association), see operating instructions
Explosion protection	-
FM approval	-
CB approval	Yes
Marine approval	-
Degree of protection (EN 60529)	IP67, enclosure type 5 indoor
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

Article number	6ES7148-4PC00-0HA0
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
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 feature 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))
MTBF at 40 °C	196 354 h
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

Accessories**Power connector**

For connecting to the
distributed I/O system

- For X1 (6 mm²)
- For X2 (4 mm²)

Article No.**6ES7148-4PC00-0HA0****3RK1911-2BE30**
3RK1911-2BF10**Article No.****National Fire Protection
Association compatible**

These devices are only approved
for installation in industrial
machinery according to the
NFPA79 Electrical Standard for
Industrial Machinery.

- for X1 SIMATIC ET200pro PS
61 88 201 1003.xx (AWG10)*
- for X1 SITOP PSU300P
61 88 201 1000.xx / 61 88 201
1002.xx (AWG14)*
- for X2 SIMATIC ET200pro PS
61 88 202 1010.xx (AWG10)*
supplied blanking cap for X2
- for X3
Phoenix-Contact
SAC-5P-M12-M12FS
supplied blanking cap for X3

Sealing cap

For 9-pole power sockets

- X2 (1 unit)
- X2 (10 units)

* <http://www.harting.com/startseite>**3RK1902-0CK00****3RK1902-0CK00**
3RK1902-0CJ00

Overview**ET 200pro motor starters in I/O system ET 200pro**

SIMATIC ET 200pro is the modular I/O system with high degree of protection IP65/66/67 for local, cabinet-free use. The ET 200pro motor starters with 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 (see pages 9/312 and 9/313)

- Only two variants up to 5.5 kW
- All settings can be parameterized by bus
- Comprehensive diagnostic signals
- Support for PROFIenergy
- Overload can be acknowledged by remote reset
- Current unbalance monitoring
- Stall protection
- EMERGENCY START function on 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-section 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
- Temperature sensor can be connected (Thermoclick or PTC type A)
- Provision of the motor current in PROFIenergy format to higher-level systems, motor current shutdown in dead times using PROFIenergy

More information

Homepage, see www.siemens.com/ET200pro

Industry Mall, see www.siemens.com/product?3RK1304

Further components in the ET 200pro distributed I/O system see Industry Mall, www.siemens.com/product?ET200pro

ET 200pro isolator modules (see page 9/314)

The isolator module with switch disconnecter function is used for safe disconnection of the 400 V operational voltage during repair work in the plant and provides an integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters).

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

Safety applications**Safety Solution local** (see page 9/317)

With the Safety local modules

- Safety local isolator module and
 - 400 V disconnecting module
- with an appropriate connection, safety level PL e (according to ISO 13849-1) can be reached.

Safety Solution PROFIsafe (see page 9/318)

With the Safety PROFIsafe modules

- F-Switch and
 - 400 V disconnecting module
- with an appropriate connection, safety levels SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) can also be reached.

Functionality

With the ET 200pro motor starters, any three-phase loads can be protected and switched.

The ET 200pro motor starters are available with mechanical and also electronic contacts.

The ET 200pro electromechanical starters are offered as direct-on-line starters (DSe) and reversing starters (RSe) as **Standard** and **High Feature** versions. There are device versions with or without control for externally fed brakes with 400 V AC.

Compared with the Standard motor starters, the **High Feature, mechanical** motor starter also has:

- Four digital inputs
- Advanced parameterization options

The ET 200pro electronic starters are offered as direct-on-line starters (sDSSSte/sDSte) and reversing starters (sRSSSte/sRSte) in the High Feature version.

Compared with the High Feature mechanical motor starters, 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

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro motor starters > General data

As a result of the protection concept with solid-state overload evaluation and the use of SIRIUS switching devices, size S00, additional advantages are realized on the Standard and High Feature motor starters – advantages that soon make themselves positively felt particularly in manufacturing processes with high plant stoppage costs:

- Configuration is made easier by the fine modular structure with ET 200pro. When using ET 200pro motor starters, the parts list per load feeder is reduced to two main items: the bus module and the motor starter. This makes the ET 200pro ideal for modular machine concepts or solutions for conveying systems and in machine-tool building.
- Expansions are easily possible through the subsequent adding of modules. The innovative plug-in technology also does away with the wiring needed up to now. Through the hot swapping function (disconnection and connection during operation) a motor starter can be replaced within seconds if necessary, without having to shut down the ET 200pro station and with it the process in the plant. The motor starters are therefore recommendable in particular for applications with special demands on availability. Storage costs are also optimized by the low level of variance (two units up to 5.5 kW).
- With four locally acting inputs available on the High Feature motor starter it is possible to realize autonomous special functions that 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.

Article No. scheme

Product versions		Article number			
Motor starters		3RK1304	- 5	<input type="checkbox"/> S <input type="checkbox"/> 0	<input type="checkbox"/> A <input type="checkbox"/> A <input type="checkbox"/>
Setting range	0.15 ... 2.0 A 1.5 ... 12 A	K L			
Product function	Direct-on-line starters DSe		4	4	Standard
	Reversing starters RSe		4	5	Standard
	Direct-on-line starters DSe		4	2	High Feature
	Reversing starters RSe		4	3	High Feature
	Direct-on-line starters sDStSe/sDStSe		7	2	High Feature
	Reversing starters sDStSe/sDStSe		7	3	High Feature
Inputs/outputs	Without brake output				0
	With brake output				3 400 V AC, with High Feature + 4 inputs
Example		3RK1304	- 5	K S 4 0	- 4 A A 0

Product versions		Article number			
Modules		3RK1304	- 0	H S 0 0	<input type="checkbox"/> A <input type="checkbox"/> A <input type="checkbox"/> 0
Product function	Isolator modules				6
	Isolator modules				7 Safety modules local
	400 V disconnecting module				8 Safety modules local/PROFIsafe
Example		3RK1304	- 0	H S 0 0	- 6 A A 0

Note:

The article number schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Type	Standard motor starters		High Feature motor starters	
	DSe, RSe		DSe, RSe	sDSSSte, sDSte, sRSSSte, sRSte
Technology designation¹⁾				
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				
• Parameterizable input signal		--	✓ 4 inputs	
• Parameterizable input level		--	✓ Latching/non-latching	
• Parameterizable input signal delay	ms	--	✓ NC/NO contacts	
• Parameterizable input signal extension	ms	--	✓ 10 ... 80	
• Parameterizable input control actions		--	✓ 0 ... 200	
			✓ 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 starters
 RS Reversing starters
 DSS .. Direct-on-line soft starters
 RSS .. Reversing soft starters
 e Electronic motor protection
 te Full motor protection (thermal + electronic)
 s Electronic switching with semiconductor.

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro motor starters > General data

Benefits

ET 200pro motor starters provide the following advantages:

- High flexibility thanks to a modular and compact design
- Little variance among all motor starter versions (two units up to 5.5 kW)
- Extensive parameterization using STEP 7 HW Config
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Extensive diagnostics and information for preventive maintenance
- Parameterizable inputs for on-site control functions (High Feature)
- Cabinet-free design thanks to high degree of protection IP65

Application

The SIMATIC ET 200pro motor starters are ideal for the use of several spatially concentrated distributed drive solutions in which several motors, or digital or analog sensors and actuators are addressed from a distributed station. They are perfectly suited for protecting and switching any AC loads.

Application areas

The SIMATIC ET 200pro motor starters are suitable for numerous sectors of industry, e.g. machinery and plant engineering or conveying applications.

Use of ET 200pro motor starters in conjunction with IE3/IE4 motors

Note:

For the use of ET 200pro motor starters in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, [see Application Manual](#).

For more information, [see www.siemens.com/IE3ready](http://www.siemens.com/IE3ready).

Technical specifications

More information			
Manual, see https://support.industry.siemens.com/cs/ww/en/view/22332388		Notes on security: System networking requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation. For more information on the subject of Industrial Security, see www.siemens.com/industrialsecurity .	
Type		Standard motor starters Mechanically switching without inputs	High Feature motor starters 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 • During storage	°C °C	-25 ... +55, from +40 with derating -40 ... +70	
Permissible mounting position		Vertical, horizontal	
Vibration resistance acc. to IEC 60068, Part 2-6	g	2	
Shock resistance acc. to IEC 60068, Part 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_g for power bus	A	25	
Rated operational voltage U_g • 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)	
Approval • DIN VDE 0106, Part 101 • CSA and UL approval	V V	Up to 400 Up to 600	
Conductor cross-sections • Incoming power 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_g 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	
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	
Utilization categories		AC-1, AC-2, AC-3, AC-4	
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)	
Permissible switching frequency		Depending on the current loading, motor starting time, and relative ON period (see manual)	
Operating times at 0.85 ... 1.1 x U_g • Closing delay • Opening delay	ms ms	11 ... 50 5 ... 45	

¹⁾ DS ... Direct-on-line starters
RS ... Reversing starters
DSS .. Direct-on-line soft starters
RSS .. Reversing soft starters
e Electronic motor protection
te Full motor protection (thermal + electronic)
s Electronic switching with semiconductor.

²⁾ 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.

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro motor starters > Standard motor starters **IE3/IE4 ready**

Overview

The functionality, device functions, and technical specifications of the Standard motor starter are described in "ET 200pro motor starters, General data" (see page 9/307 onwards).

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", page 9/323).

Overview

The functionality, device functions, and technical specifications of the High Feature motor starter are described in "ET 200pro motor starters, General data" (see page 9/307 onwards).

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


sRSSt High Feature

Direct-on-line starters sDSSt/sDSt¹⁾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
Reversing starters sRSSt/sRSt¹⁾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", page 9/323).

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).

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro motor starters > ET 200pro isolator modules **IE3/IE4 ready**

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 to safely disconnect the 400 V operating voltage during repair work 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 available in addition in a safety version (see "Safety local isolator module" on page 9/315).

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 Part 2-27		
	g/ms	Half-sine 15/11
Power 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 power 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, according 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 modules, mechanical



3RK1304-OHS00-6AA0

Isolator modules¹⁾

Rated operational current 25 A

3RK1304-OHS00-6AA0

¹⁾ Only functions when used together with the related 110 mm backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see page 9/323).

Overview**Safety Solution local**

With the Safety local modules

- Safety local isolator module and
 - 400 V disconnecting module
- with an appropriate connection, safety level PL e (according to ISO 13849-1) can be reached.



ET 200pro motor starter (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 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 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.

FunctionalitySafety 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 two 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 PL e.

In combination with the 400 V disconnecting module, the Safety local isolator module can be used for safety applications up to PL e.

400 V disconnecting module

The 400 V 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 PL e.

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro Safety motor starters Solutions local/PROFIsafe > Safety modules local

Technical specifications

Type		Safety local isolator module	400 V disconnecting module
General data			
Mounting dimensions (W x H x D)			
• 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, Part 2-6		2 g	
Shock resistance acc. to IEC 60068, Part 2-27		Half-sine 15 g/11 ms	
Power consumption			
• From auxiliary circuit L+/M (U1)	mA	Approx. 20	
• From auxiliary circuit A1/A2 (U2)		--	
Rated operational current 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 power 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, according to DIN VDE 0106, Part 101	
Operating times at 0.85 ... 1.1 x U_s			
• Closing delay	ms	--	25 ... 100
• Opening delay	ms	--	7 ... 10
Device functions			
• Group diagnostics		Yes, parameterizable	
Device indications			
• Group fault		SF LED (red)	

Selection and ordering data

Version	Article No.
---------	-------------

Safety modules local



3RK1304-0HS00-7AA0

Safety local isolator module¹⁾²⁾

Rated operational current 16 A

3RK1304-0HS00-7AA0

3RK1304-0HS00-8AA0

400 V disconnecting module³⁾⁴⁾

Rated operational current 25 A

3RK1304-0HS00-8AA0

- 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 "Accessories for ET 200pro motor starters", page 9/323).
- 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 "Accessories for ET 200pro motor starters", page 9/323).

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro Safety motor starters Solutions local/PROFIsafe > Safety modules PROFIsafe **IE3/IE4 ready**

Overview

Safety Solution PROFIsafe

With the Safety PROFIsafe modules

- F-Switch and
- 400 V disconnecting module

With an appropriate connection, safety levels SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) can be reached.

F-Switch PROFIsafe

Fail-safe digital inputs/outputs in degrees of protection IP65 to IP67 for near-machine, cabinet-free use.

Fail-safe digital inputs

- For the fail-safe reading in of sensor information (1-/2-channel)
- Including integrated discrepancy evaluation for 2V2 signals
- Internal sensor supplies (incl. testing) available

Fail-safe digital outputs

- Three 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 <https://support.industry.siemens.com/cs/ww/en/view/109739348>



Functionality

The PROFIsafe F-Switch is a fail-safe solid-state module for PROFIsafe safety applications. It has two fail-safe inputs and outputs for safe switching of the 24 V supply over backplane busbars. In combination with the 400 V disconnecting module, fail-safe disconnection of ET 200pro motor starters is possible in PROFIsafe applications up to SIL 3/PL e.

400 V disconnecting module

See "Safety modules local", Overview, page 9/315 and Technical specifications, page 9/316.

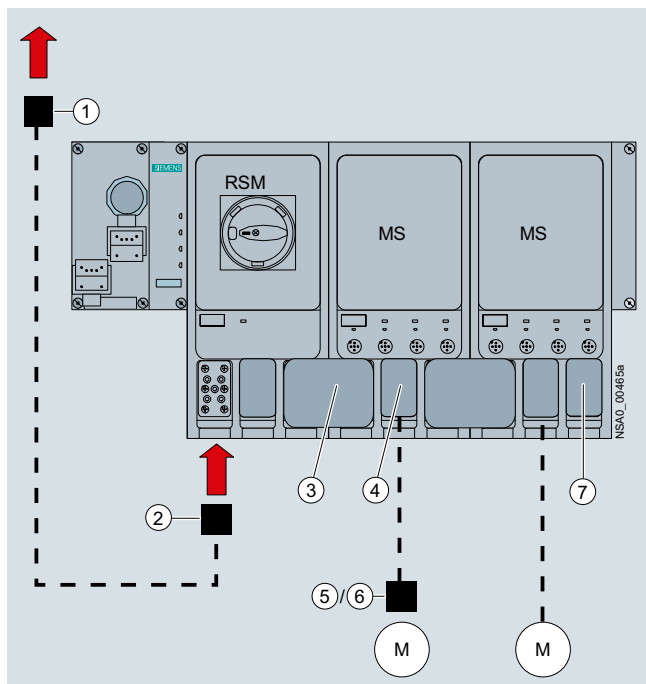
Selection and ordering data

Version	Article No.
Safety modules PROFIsafe	
 3RK1304-0HS00-8AA0 400 V disconnecting modules¹⁾²⁾ Rated operational current 25 A	3RK1304-0HS00-8AA0
 6ES7148-1FS00-0AB0 F-Switch PROFIsafe 24 V DC, including bus module Note: Connection module must be ordered separately	6ES7148-4FS00-0AB0
Connection modules for F-Switch 24 V DC	6ES7194-4DA00-0AA0

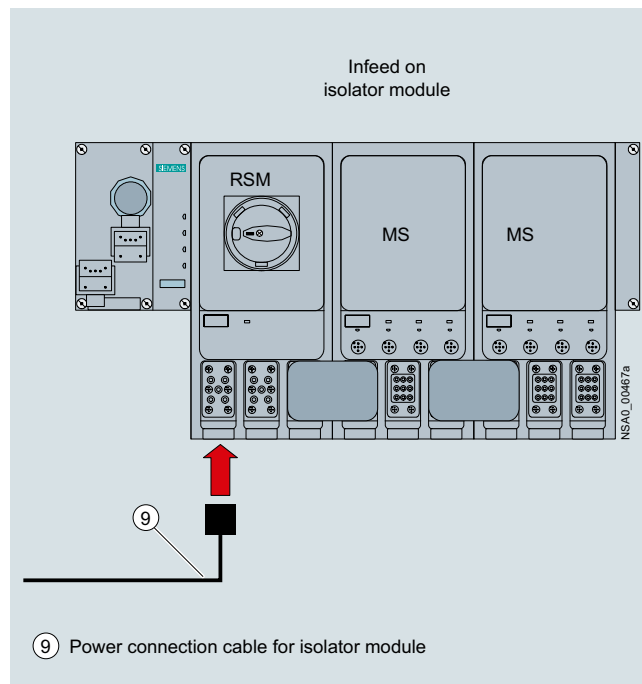
¹⁾ The 400 V disconnecting module functions only when used together with the Safety local isolator module or with the F-Switch.

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 "Accessories for ET 200pro motor starters", page 9/323).

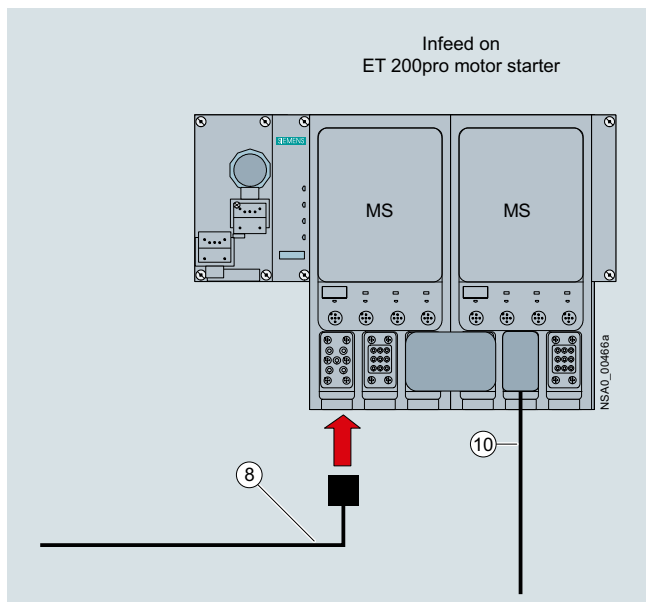
Overview



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 energy



Infeed on the RSM isolator module



Infeed on the ET 200pro motor starter

Legend:

- ① Power feeder plug (see page 9/321)
- ② Power connection plug (see page 9/321)
- ③ Power jumper plug (see page 9/321)
- ④ Motor connection plug (see page 9/321)
- ⑤ Motor plug (see page 9/321)
- ⑥ Motor plug with EMC suppressor circuit (see page 9/321)
- ⑦ Power loop-through plug (see page 9/321)
- ⑧ Power connection cable (see page 9/321)
- ⑨ Power connection cable for isolator module (see page 9/321)
- ⑩ Motor cable (see page 9/322)

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro Safety motor starters Solutions local/PROFIsafe > Accessories for ET 200pro motor starters

Power bus

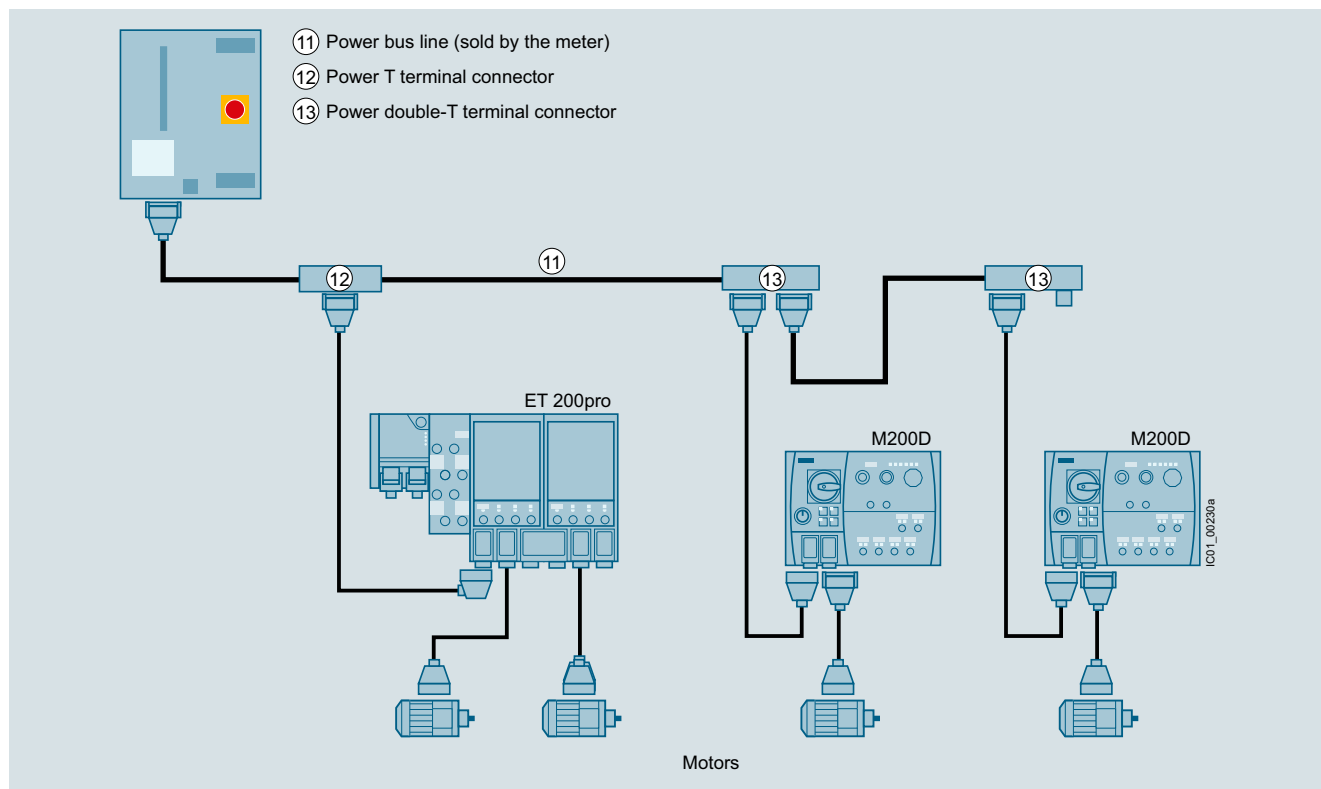
The power supply to the field devices (ET 200pro motor starters, M200D motor starters) is provided via the power bus, in which the power T terminal connectors or power double-T terminal connectors are connected by power bus cables.

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. the power bus is not interrupted when the components are plugged in.



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 bushings
- 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⁾

For the connection modules with the associated accessories, see "Accessories ET 200pro interface modules", page 9/277).

Motor control via PROFINET

For the connection modules with the associated accessories, see "Accessories for ET 200pro interface modules", page 9/281 onwards.

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 (see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10314206?tree=CatalogTree>).

²⁾ On the control cabinet bushings with two M12 sockets for the PROFIBUS M12 connecting cables (see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10314206?tree=CatalogTree>), the 24 V supply of the motor starters is implemented via separate 7/8" connecting cables.

Selection and ordering data



Version	Article No.
Incoming power supply	
<p>① Power feeder plugs Connector set for incoming power 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. bushing</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 incoming power 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, including bushing</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, 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 plugs</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, including bushing</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 cables	
<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. bushing</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, including bushing</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, including star jumper, including bushing</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>

I/O Systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

ET 200pro Safety motor starters Solutions local/PROFIsafe > Accessories for ET 200pro motor starters

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"> • For motor without brake, for ET 200pro, 4 x 1.5 mm² • For motor with brake for ET 200pro, 6 x 1.5 mm² • For motor without brake, with thermistor, for ET 200pro, 6 x 1.5 mm² • For motor with brake and thermistor for ET 200pro, 8 x 1.5 mm² 	<p>3RK1911-0EB31 3RK1911-0ED31 3RK1911-0EF31 3RK1911-0EG31</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 cable 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 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 3RK1911-5BA10 3RK1911-5BA20 3RK1911-5BA30 3RK1911-5BA50</p>
Further accessories for power connections	
<p> 3RK1902-0CW00</p> <p>Crimping tool for pins/sockets, 4 mm² and 6 mm²</p>	<p>3RK1902-0CW00</p>
<p> 3RK1902-0CK00</p> <p>Dismantling tools</p> <ul style="list-style-type: none"> • For male and female contacts for 9-pole HAN Q4/2 inserts • For male and female contacts for 9-pole HAN Q8 inserts 	<p>3RK1902-0AB00 3RK1902-0AJ00</p>
<p>Sealing caps For 9-pole power socket connectors</p> <ul style="list-style-type: none"> • 1 unit per pack • 10 units per pack 	<p>3RK1902-0CK00 3RK1902-0CJ00</p>

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 module 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 Notes: <ul style="list-style-type: none"> 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 caps For sealing unused M12 input or output sockets (one set contains ten sealing caps)	3RK1901-1KA00
Motor suppression module NEW RC element for installation in motor terminal box <ul style="list-style-type: none"> Type of construction square 	3RK1911-6EA00
<ul style="list-style-type: none"> Type of construction round 	3RK1911-6EB00



3RK1922-3BA00



3RK1901-1KA00



3RK1911-6EA00



3RK1911-6EB00

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 starter and the optional module.

Notes:

- For motor control with PROFIBUS, see page 9/277
- For motor control with PROFINET, see page 9/281
- For Manual "SIMATIC ET 200pro Motor Starters", see <https://support.industry.siemens.com/cs/ww/en/view/22332388>

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

SIMATIC ET 200pro FC-2 frequency converter

Overview



SIMATIC ET 200pro FC-2 frequency converter

The SIMATIC ET 200pro FC-2 frequency converter has the design of a SIMATIC ET 200pro module. It supplements the SIMATIC ET 200pro system range with distributed, speed-controlled drives. It is suitable for the open-loop and closed-loop control of asynchronous (induction) motors in a wide range of industrial applications. It is predestined for conveyor technology applications using drives networked via PROFIBUS and PROFINET, in particular in distributed designs without control cabinet with high degree of protection (IP65), when combining several drives. The modular, service-friendly concept is ideally suited to manufacturing processes with high plant standstill costs.

Reasons for using distributed drive systems:

- Modular drive solutions – therefore standardized mechatronic elements that can be individually tested
- A control cabinet is not required, resulting in a smaller space requirement and lower cooling requirements
- Long motor cables between converter and motor are not required
 - Less power losses
 - Reduced noise radiation
 - Reduced costs for shielded cables
 - No additional filters

- Distributed configurations offer considerable benefits for conveyor systems with their extensive coverage (e.g. in the automotive and logistics industries)

Siemens family of distributed drives

Siemens offers an innovative portfolio of frequency converters to optimally implement distributed drive solutions. The strengths of the individual members of the drive family permit simple adaptation to the widest range of application demands:

- Identical connection systems
- Standard commissioning and engineering tools for the family of distributed drives:
 - SINAMICS G110M frequency converters
 - SINAMICS G110D frequency converters
 - SINAMICS G120D frequency converters
 - SIMATIC ET 200pro FC-2 frequency converters
 - SIRIUS M200D motor starters

Safety Integrated

The distributed SIMATIC ET 200pro FC-2 frequency converters are already equipped with the integrated STO (Safe Torque Off) safety function, certified in accordance with IEC 61508 SIL 2 as well as EN ISO 13849-1 PL d and Category 3. It can be activated locally via the F-RSM or by means of PROFIsafe.

STARTER commissioning tool

The STARTER commissioning tool (V4.4 and higher) plus the corresponding SINAMICS Support Package (SSP) supports the commissioning and maintenance of SIMATIC ET 200pro FC-2 frequency converters.

The operator guidance combined with comprehensive, user-friendly functions for the relevant drive solution allow you to commission the device quickly and easily.

Engineering Framework STEP 7 classic (V5.5 and higher)

Hardware Support Packages (HSP) are available to integrate SIMATIC ET 200pro FC-2 in STEP7 classic.

Engineering Framework TIA Portal (as from V13 SP1)

TIA Portal is a powerful engineering framework providing full access to the whole digitized automation.

Hardware Support Packages (HSP) are available to integrate SIMATIC ET 200pro FC-2 in TIA Portal.

Technical specifications

Distributed frequency converter	SIMATIC ET 200pro FC-2
Selection features	
Integrated safety functions acc. to IEC 61508 SIL 2 and EN ISO 13849-1 PL d and Category 3	<ul style="list-style-type: none"> • Safe Torque Off (STO) • Control of the integrated safety function via the Safety Local isolator module F-RSM or via F-Switch PROFIsafe
Electrical data	
Line voltage	380 ... 480 V 3 AC ±10 %
Power	
• With an ambient temperature of 0 ... 55 °C	1.1 kW
• With an ambient temperature of 0 ... 45 °C	1.5 kW
Rated input current/output current	
• With an ambient temperature of 0 ... 55 °C	2 A/3.5 A
• With an ambient temperature of 0 ... 45 °C	2.5 A/3.9 A
Line frequency	47 ... 63 Hz

Technical specifications (continued)

Distributed frequency converter	SIMATIC ET 200pro FC-2																				
Overload capability	<ul style="list-style-type: none"> Overload current 1.5 x rated output current (i.e. 150 % overload) for 60 s, cycle time 300 s Overload current 2 x rated output current (i.e. 200 % overload) for 3 s, cycle time 300 s 																				
Output frequency	0 ... 550 Hz																				
Pulse frequency	4 kHz (standard), 4 ... 16 kHz (in 2-kHz increments)																				
Standard SCCR (Short Circuit Current Rating)	10 kA																				
Skipped frequency range	1, programmable																				
Converter efficiency	95 ... 97 %																				
Interfaces	<ul style="list-style-type: none"> Connection to PROFIBUS and PROFINET over the SIMATIC ET 200pro backplane bus Mini USB interface for commissioning via PC (as from STARTER V4.4 plus SSP) Optical interface for commissioning via the IOP-2 Handheld Slot for an optional memory card (SD) for uploading or downloading parameter settings. Facilitates easy device replacement. PTC, bimetal, KTY84, Pt1000 interface for motor temperature monitoring 																				
Functions																					
Open-loop/closed-loop control techniques	<ul style="list-style-type: none"> V/f control – linear ($M \sim n$) with/without flux current control (FCC), quadratic ($M \sim n^2$) or parameterizable Vector control – sensorless Closed-loop torque control 																				
Operating functions	<ul style="list-style-type: none"> Jogging BICO technology Automatic restart following interruptions in operation due to a power failure Smooth connection of converter to rotating motor 																				
Braking functions	<ul style="list-style-type: none"> Integrated regenerative feedback functionality Control of an electromagnetic holding brake <p>Integrated brake control supplies DC power supply to the brake</p> <table border="1"> <thead> <tr> <th></th> <th>380 V AC</th> <th>400 V AC</th> <th>440 V AC</th> <th>480 V AC</th> </tr> </thead> <tbody> <tr> <td>Line voltage</td> <td>380 V AC</td> <td>400 V AC</td> <td>440 V AC</td> <td>480 V AC</td> </tr> <tr> <td>Rectified brake voltage</td> <td>171 V DC</td> <td>180 V DC</td> <td>198 V DC</td> <td>216 V DC</td> </tr> <tr> <td>Recommended brake coil voltage for Siemens motors</td> <td>170 ... 200 V DC</td> <td>170 ... 200 V DC 184 ... 218 V DC</td> <td>184 ... 218 V DC</td> <td>184 ... 218 V DC</td> </tr> </tbody> </table> <p>Disconnection on the DC side permits "fast" braking.</p>		380 V AC	400 V AC	440 V AC	480 V AC	Line voltage	380 V AC	400 V AC	440 V AC	480 V AC	Rectified brake voltage	171 V DC	180 V DC	198 V DC	216 V DC	Recommended brake coil voltage for Siemens motors	170 ... 200 V DC	170 ... 200 V DC 184 ... 218 V DC	184 ... 218 V DC	184 ... 218 V DC
	380 V AC	400 V AC	440 V AC	480 V AC																	
Line voltage	380 V AC	400 V AC	440 V AC	480 V AC																	
Rectified brake voltage	171 V DC	180 V DC	198 V DC	216 V DC																	
Recommended brake coil voltage for Siemens motors	170 ... 200 V DC	170 ... 200 V DC 184 ... 218 V DC	184 ... 218 V DC	184 ... 218 V DC																	
Protective functions	<ul style="list-style-type: none"> Undervoltage Overvoltage Ground fault Short-circuit Stall protection Thermal motor protection (I^2t or sensor) Converter overtemperature Motor blocking protection Phase failure detection 																				
Connectable motors	<ul style="list-style-type: none"> Low-voltage asynchronous (induction) motors Motor cable lengths: max. 15 m (49 ft) (shielded) 																				
Mechanical data																					
Degree of protection	IP65																				
Operating temperature	0 ... 55 °C (32 ... 131 °F)																				
Mounting position	Vertical wall mounting (vertical alignment of the cooling fins)																				
Dimensions (W x H x D)	155 mm x 246 mm x 248 mm (6.10 in x 9.69 in x 9.76 in)																				
Weight, approx.	4 kg (8.8 lb)																				
Standards																					
Certificates of suitability	UL508C, cUL, CE, Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU																				

I/O Systems

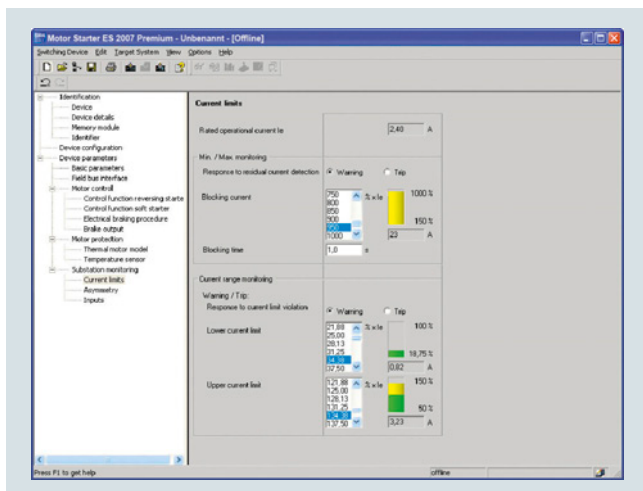
SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

SIMATIC ET 200pro FC-2 frequency converter

Ordering data	Article No.	Ordering data	Article No.
SIMATIC ET 200pro FC-2 frequency converter with integrated safety function STO (Safe Torque Off)	6SL3514-1KE13-5AE0	STARTER commissioning tool ¹⁾ on DVD-ROM	6SL3072-0AA00-0AG0
Backplane bus module for mounting the frequency converter (absolutely essential for operation of the converter)	6SL3260-2TA00-0AA0	PC inverter connection kit 2 Mini USB interface cable for communication with a PC, 3 m long	6SL3255-0AA00-2CA0
Accessories		Connecting cable pre-assembled at one end Power supply cable, open at one end, for HAN Q4/2, angled, 4 × 4 mm ²	
IOP-2 Handheld For use with SINAMICS G120 SINAMICS G120C SINAMICS G120P SINAMICS G110D SINAMICS G120D SINAMICS G110M SIMATIC ET 200pro FC-2 Included in the scope of supply:	6SL3255-0AA00-4HA1	<ul style="list-style-type: none"> • Length 1.5 m • Length 5 m 	3RK1911-0DB13 3RK1911-0DB33
<ul style="list-style-type: none"> • IOP-2 • Handheld housing • Rechargeable batteries (4 × AA) • Charging unit (international) • RS 232 connecting cable 3 m long, for use with SINAMICS G120 SINAMICS G120C SINAMICS G120P • USB cable, length 1 m 		Connector set for the power supply HAN Q4/2	<ul style="list-style-type: none"> • 2.5 mm² • 4 mm² • 6 mm²
RS 232 interface cable Length 2.5 m, With optical interface to connect SINAMICS G110D SINAMICS G120D SINAMICS G110M SIMATIC ET 200pro FC-2 to the IOP-2 Handheld	3RK1922-2BP00	Motor cables pre-assembled at one end Cross-section	(HTG: supplied by Harting) (ZKT: supplied by KnorrTec)
Memory cards		<ul style="list-style-type: none"> • Length 1,5 m • Length 3 m • Length 5 m • Length 10 m 	4 × 1.5 mm² 2 × (2 × 0.75 mm²) HTG: 61 88 201 0288 ZKT: 70020501000150
SINAMICS SD card 512 MB	6SL3054-4AG00-2AA0	Connector set for motor cable HAN Q8, shielded	HTG: 61 88 201 0289 ZKT: 70020501000300
Optional Firmware memory cards		Power jumper connector	HTG: 61 88 201 0290 ZKT: 70020501000500
SINAMICS SD card 512 MB + Firmware V4.7 SP10 (Multicard V4.7 SP10)	6SL3054-7TF00-2BA0		HTG: 61 83 401 0131 ZKT: 10032001

¹⁾ The STARTER commissioning tool is also available on the Internet at <http://www.siemens.com/starter>

Overview



Motor Starter ES for parameterization, monitoring, diagnostics and testing of motor starters

More information

Homepage see www.siemens.com/sirius-engineering

Industry Mall see www.siemens.com/product?3ZS1

Technical specifications and system requirements, see <https://support.industry.siemens.com/cs/ww/en/ps/16713/td>

Motor Starter ES is used for the startup, parameterization, diagnostics, documentation and preventive maintenance of SIMATIC ET 200S, ET 200pro, ECOFAST and M200D motor starters.

Interfacing is performed

- Via the local interface on the device
- With PROFIBUS DP-V1-capable motor starters from any point in PROFIBUS (applies to ET 200S DP V1/ET 200pro/ECOFAST/M200D)
- With PROFINET-capable motor starters from any point in PROFINET (applies to ET 200S DP V1/ET 200pro/M200D).

Using Motor Starter ES, the communication-capable motor starters are easily parameterized during startup, 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 via 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 (slave pointer, statistics data)	--	✓	✓
Access via PROFIBUS	--	--	✓
Access via PROFINET	--	--	✓
S7 routing	--	--	✓
Teleservice via MPI	--	--	✓
STEP 7 object manager ¹⁾	--	--	✓
Trace function	--	✓	✓

✓ Function available

-- Function not available

¹⁾ Only for STEP 7 V5.x

Additional functions

Standard-compliant 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.

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro software > Motor Starter ES

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).

Selection and ordering data

Parameterization, startup and diagnostics software Motor Starter ES 2007

For ECOFAST Motor Starter, SIMATIC ET 200S High-Feature Starter, SIMATIC ET 200pro Starter and M200D (AS-I Standard, PROFIBUS, PROFINET)

- Delivered without PC cable

Version	Article No.
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Motor Starter ES 2007 Basic



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 via system interface

- License key on USB flash drive, Class A, including CD
- License key download, Class A, without CD

3ZS1310-4CC10-0YA5
3ZS1310-4CE10-0YB5

3ZS1310-4CC10-0YA5

Motor Starter ES 2007 Standard



Floating license for one user

Engineering software, software and documentation on CD, 3 languages (German/English/French), communication via system interface

- License key on USB flash drive, Class A, including CD
- License key download, Class A, without CD

3ZS1310-5CC10-0YA5
3ZS1310-5CE10-0YB5

3ZS1310-5CC10-0YA5

Motor Starter ES 2007 Premium



Floating license for one user

Engineering software, software and documentation on CD, 3 languages (German/English/French), communication via system interface or PROFIBUS/PROFINET, STEP 7 Object Manager

- License key on USB flash drive, Class A, including CD
- License key download, Class A, without CD

3ZS1310-6CC10-0YA5
3ZS1310-6CE10-0YB5

3ZS1310-6CC10-0YA5

Notes:

Please order PC cable separately, see [Accessories](#).

For a description of the software versions, see [page 9/327](#).

Accessories

Version	Article No.
---------	-------------

Optional accessories

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 adapters

For connecting an RS 232 PC cable to the USB interface of a PC, recommended for use in conjunction with ET 200S/ECOFAST/ET 200pro motor starters

3UF7946-0AA00-0

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:EIP200PRO Ethernet/IP Head Assembly for ET 200PRO
Supply voltage	
Rated value (DC)	24 V
Input current	
from supply voltage 1L+, max.	400 mA
Power loss	
Power loss, typ.	6 W
Address area	
Addressing volume	
• Inputs	255 byte
• Outputs	255 byte
M12 port	
• Autonegotiation	Yes
• Transmission rate, max.	100 Mbit/s
Diagnostics indication LED	
• Bus fault BF (red)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
• Load voltage monitoring 24 V DC (green)	Yes
Potential separation	
between backplane bus and electronics	Yes
between supply voltage and electronics	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Dimensions	
Width	135 mm
Height	130 mm
Depth	59.3 mm
Weights	
Weight, approx.	490 g

Article number	ZNX:EIP200PROCM1 ET 200pro, CM IM DP M12 / 7/8"
Input current	
from supply voltage 1L+, max.	No current input, only infeed current, max. 8 A
from load voltage 2L+ (without load), max.	No current input, only infeed current, max. 8 A
Dimensions	
Width	90 mm
Height	130 mm
Depth	51 mm
Weights	
Weight, approx.	540 g

Ordering data

SIMATIC ET 200pro interface module for EtherNet/IP

Including:

- Bus terminating module for ET 200pro
- Companion disk with the manuals and the Configuration Tool

Article No.**ZNX:EIP200PRO****Article No.**

Connecting module for EtherNet/IP

for connecting the interface module to EtherNet/IP

ZNX:EIP200PROCM1

I/O Systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

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.
 - Various I/O modules, 30 mm and 45 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 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 power 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
General information	
Product type designation	IM 157-1 DP
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
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
Address area	
Address space per station	
• Address space per station, max.	244 byte
Interfaces	
Number of PROFIBUS interfaces	1
1. 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

Article number	6ES7157-1AA00-0AB0 ET 200AL, IM 157-1 DP
PROFIBUS DP	
Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- Direct data exchange (slave-to-slave communication)	Yes
- DPV0	Yes
- DPV1	Yes
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	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
Potential separation	
between the load voltages	Yes
between PROFIBUS DP and all other circuit components	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2

I/O SystemsSIMATIC 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
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Connection method	
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded

Article number	6ES7157-1AA00-0AB0 ET 200AL, IM 157-1 DP
Dimensions	
Width	45 mm
Height	159 mm
Depth	46 mm
Weights	
Weight, approx.	211 g

Ordering data**Article No.****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-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors	
0.19 m	6ES7194-2LH02-0AA0
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
15 m	6ES7194-2LN15-0AA0
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
15 m	6ES7194-2LN15-0AB0
Pre-assembled at one end, 1 M8 connector	
2 m	6ES7194-2LH20-0AC0
5 m	6ES7194-2LH50-0AC0
10 m	6ES7194-2LN10-0AC0
15 m	6ES7194-2LN15-0AC0

M8 power cable	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	6ES7194-2LH02-1AA0
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
15 m	6ES7194-2LN15-1AA0
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
15 m	6ES7194-2LN15-1AB0
Pre-assembled at one end, M8 socket	
2 m	6ES7194-2LH20-1AC0
5 m	6ES7194-2LH50-1AC0
10 m	6ES7194-2LN10-1AC0
15 m	6ES7194-2LN15-1AC0
M8 connector for ET connection	6ES7194-2AB00-0AA0
4-pin, shielded	
M8 power connector	
Male contact insert, 4-pin	6ES7194-2AA00-0AA0
Female contact insert, 4-pin	6ES7194-2AC00-0AA0
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



- Interface module for linking the ET 200AL to PROFINET
- Handles data exchange with the PROFINET I/O 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 μ s
- 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)
- PROFlenergy

Technical specifications

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
General information	
Product type designation	IM 157-1 PN
Product function	
• I&M data	Yes; I&M0 to I&M4
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
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
Address area	
Address space per station	
• Address space per station, max.	1 430 byte
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET
Interface types	
• integrated switch	Yes
• M12 port	Yes; 2x M12 d-coded
Protocols	
• PROFINET IO Device	Yes
M12 port	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	Yes; for Ethernet services
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
Protocols	
PROFINET IO Device	
Services	
- Open IE communication	Yes
- IRT	Yes; 250 μ s, 500 μ s, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms
- PROFlenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
Redundancy mode	
• MRP	Yes
• MRPD	Yes
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	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
Potential separation	
between the load voltages	Yes
between PROFINET and all other circuits	Yes
Degree and class of protection	
IP degree of protection	IP65/67

I/O Systems

SIMATIC 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
Standards, approvals, certificates	Suitable for safety-related tripping of standard modules Yes; From FS01
Highest safety class achievable for safety-related tripping of standard modules	PL d
<ul style="list-style-type: none"> Performance level according to ISO 13849-1 Category according to ISO 13849-1 SILCL according to IEC 62061 	Cat. 3 SILCL 2
Ambient conditions	
Ambient temperature during operation	
<ul style="list-style-type: none"> min. max. 	-25 °C 55 °C

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
Connection method	Design of electrical connection for supply voltage M8, 4-pole
ET-Connection	• ET-Connection M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	263 g

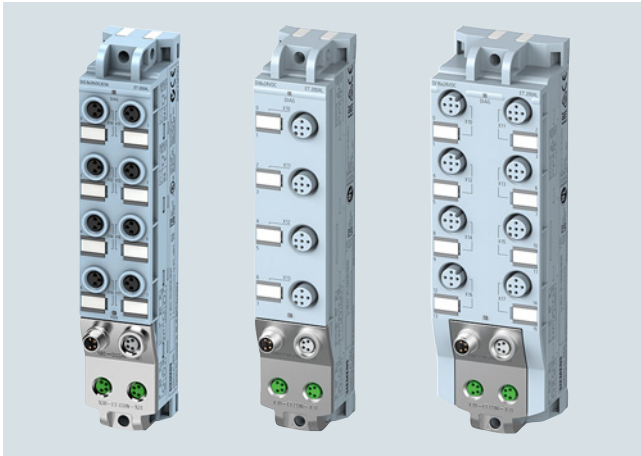
Ordering data

Ordering data	Article No.
IM 157-1 PN interface module	6ES7157-1AB00-0AB0
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	
0.19 m	6ES7194-2LH02-0AA0
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
15 m	6ES7194-2LN15-0AA0
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
15 m	6ES7194-2LN15-0AB0
Pre-assembled at one end, 1 M8 connector	
2 m	6ES7194-2LH20-0AC0
5 m	6ES7194-2LH50-0AC0
10 m	6ES7194-2LN10-0AC0
15 m	6ES7194-2LN15-0AC0

Article No.

Power cable M8	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	6ES7194-2LH02-1AA0
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
15 m	6ES7194-2LN15-1AA0
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
15 m	6ES7194-2LN15-1AB0
Pre-assembled at one end, M8 socket	
2 m	6ES7194-2LH20-1AC0
5 m	6ES7194-2LH50-1AC0
10 m	6ES7194-2LN10-1AC0
15 m	6ES7194-2LN15-1AC0
M8 connector for ET connection	6ES7194-2AB00-0AA0
4-pin, shielded	
M8 power connector	
Male contact insert, 4-pin	6ES7194-2AA00-0AA0
Female contact insert, 4-pin	6ES7194-2AC00-0AA0
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 and 45 mm wide modules with parameters and diagnostic functions
- 8-channel digital input module with M8 or M12 connection
- 16-channel digital input module with M12 connection
- 8-channel digital input/output module with M8 or M12 connection
- 16-channel digital input / output module with M12 connection
- 8-channel digital output module 2A with M12 connection

Technical specifications

Article number	6ES7141-5BF00-0BA0	6ES7141-5AF00-0BA0	6ES7141-5AH00-0BA0
	ET 200AL, DI 8x24VDC, 8xM8	ET 200AL, DI 8x24VDC, 4xM12	ET 200AL, DI 16x24VDC, 8xM12
General information			
Product type designation	DI 8x24VDC	DI 8x24VDC	DI 16x24VDC
Engineering with			
• STEP 7 TIA Portal configurable/integrated as of version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3	V5.5 SP4 Hotfix 7 or higher	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3.1	GSDML V2.3.1	GSDML V2.3.1
Supply voltage			
Load voltage 1L+			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current			
Current consumption (rated value)	25 mA; without load	25 mA; without load	30 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
Encoder supply			
Number of outputs	8	4	8
24 V encoder supply			
• Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic	Yes; per module, electronic
• Output current, max.	0.7 A; Total current of all encoders	0.7 A; Total current of all encoders	1.4 A; Total current of all encoders
Digital inputs			
Number of digital inputs	8	8	16
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
Number of simultaneously controllable inputs			
all mounting positions			
- up to 55 °C, max.	8	8	16
Input voltage			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V	-30 to +5V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V
Input current			
• for signal "1", typ.	3.2 mA	3.2 mA	3.2 mA

I/O SystemsSIMATIC 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	6ES7141-5AF00-0BA0 ET 200AL, DI 8x24VDC, 4xM12	6ES7141-5AH00-0BA0 ET 200AL, DI 16x24VDC, 8xM12
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
Interrupts/diagnostics/status information			
Alarms			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages			
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module
Diagnostics indication LED			
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for module diagnostics	Yes; Green/red LED	Yes; Green/red LED	Yes; Green/red LED
Potential separation			
between the load voltages	Yes	Yes	Yes
Potential separation channels			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
• between the channels and the power supply of the electronics	No	No	No
Degree and class of protection			
IP degree of protection	IP65/67	IP65/67	IP65/67
Standards, approvals, certificates			
Suitable for safety-related tripping of standard modules	Yes; From FS01	Yes; From FS01	Yes; From FS01
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C	-25 °C	-25 °C
• max.	55 °C	55 °C	55 °C
Connection method			
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole	M8, 4-pole
ET-Connection			
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded
Dimensions			
Width	30 mm	30 mm	45 mm
Height	159 mm	159 mm	159 mm
Depth	40 mm	40 mm	40 mm
Weights			
Weight, approx.	145 g	145 g	184 g

Technical specifications (continued)

Article number	6ES7142-5AF00-0BA0 ET 200AL, DQ 8x24VDC/2A, 8xM12
General information	
Product type designation	DQ 8x24VDC/2A
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	V5.5 SP4 Hotfix 7 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
• Reverse polarity protection	Yes; against destruction; load increasing
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; load increasing
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
Digital outputs	
Number of digital outputs	8
• in groups of	4; 2 load groups for 4 outputs each
Short-circuit protection	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	2L+ (-47 V)
Switching capacity of the outputs	
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.1 Hz; 0.25 Hz at 25 °C
• on lamp load, max.	1 Hz
Total current of the outputs	
• Current per group, max.	4 A; For inductive load max. 2 channels per group
Cable length	
• unshielded, max.	30 m

Article number	6ES7142-5AF00-0BA0 ET 200AL, DQ 8x24VDC/2A, 8xM12
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; channel by channel, parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Short-circuit	Yes; Outputs to ground; module by module
Diagnostics indication LED	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
• For load voltage monitoring	Yes; Green LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels, in groups of	4
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No; 4 channels are non-isolated and 4 channels are isolated from supply voltage 1L+
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	192 g

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

I/O modules > Digital I/O modules

Technical specifications (continued)

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 8xM8	6ES7143-5AF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 4xM12	6ES7143-5AH00-0BA0 ET 200AL, DIQ 16x24VDC/0.5A, 8xM12
General information			
Product type designation	DIQ 4+DQ 4x24VDC/0.5A	DIQ 4+DQ 4x24VDC/0.5A	DIQ 16x24VDC/0.5A
Engineering with			
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V14 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3	V5.5 SP4 Hotfix 7 or higher	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1	GSDML V2.3.1	GSDML V2.3.1
Operating mode			
• DI			Yes
• Counter			Yes
• DQ			Yes
Supply voltage			
Load voltage 1L+			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Load voltage 2L+			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Input current			
Current consumption (rated value)	40 mA; without load	40 mA; without load	75 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
Encoder supply			
Number of outputs	4	4	8
24 V encoder supply			
• Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic	Yes; Per load voltage, electronic
• Output current, max.	0.7 A; Total current of all encoders	0.7 A; Total current of all encoders	1.4 A; Total current of all encoders, max. 0.7 A per load voltage
Digital inputs			
Number of digital inputs	4; Parameterizable as DIQ	4; Parameterizable as DIQ	16; Parameterizable as DIQ
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
Number of simultaneously controllable inputs			
all mounting positions			
- up to 55 °C, max.	4	4	16
Digital input functions, parameterizable			
• Freely usable digital input			Yes
• Counter			Yes
Input voltage			
• 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 "1", typ.	3.2 mA	3.2 mA	3 mA
Input delay (for rated value of input voltage)			
for standard inputs			
- parameterizable			Yes
for technological functions			
- parameterizable			Yes

Technical specifications (continued)

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 8xM8	6ES7143-5AF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 4xM12	6ES7143-5AH00-0BA0 ET 200AL, DIQ 16x24VDC/0.5A, 8xM12
Digital outputs			
Number of digital outputs	8; 4 DQ fixed, 4 DIQ parameterizable	8; 4 DQ fixed, 4 DIQ parameterizable	16; Parameterizable as DIQ
• in groups of	4; 2 load groups for 4 outputs each	4; 2 load groups for 4 outputs each	8; 2 load groups for 8 outputs each
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	2L+ (-47 V)	2L+ (-47 V)	L+ (-53 V)
Digital output functions, parameterizable			
• Switching tripped by comparison values			Yes
• Freely usable digital output			Yes
Switching capacity of the outputs			
• on lamp load, max.	5 W	5 W	5 W
Load resistance range			
• lower limit	48 Ω	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
Output voltage			
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)
Output current			
• for signal "1" rated value	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
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
Total current of the outputs			
• Current per group, max.	2 A	2 A	4 A
Cable length			
• 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
Interrupts/diagnostics/status information			
Substitute values connectable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable
Alarms			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages			
• Short-circuit	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module
Diagnostics indication LED			
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for module diagnostics	Yes; Green/red LED	Yes; Green/red LED	Yes; Green/red LED
• For load voltage monitoring	Yes; Green LED	Yes; Green LED	Yes; Green LED
Potential separation			
between the load voltages	Yes	Yes	Yes
Potential separation channels			
• between the channels, in groups of	4; DIQ channels are isolated from DQ channels	4; DIQ channels are isolated from DQ channels	8
• between the channels and backplane bus	Yes	Yes	Yes
• between the channels and the power supply of the electronics	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+	No; 8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+
Degree and class of protection			
IP degree of protection	IP65/67	IP65/67	IP65/67

I/O SystemsSIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL**I/O modules > Digital I/O modules****Technical specifications (continued)**

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 8xM8	6ES7143-5AF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 4xM12	6ES7143-5AH00-0BA0 ET 200AL, DIQ 16x24VDC/0.5A, 8xM12
Standards, approvals, certificates			
Suitable for safety-related tripping of standard modules	Yes; From FS01	Yes; From FS01	
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1	PL d	PL d	
• Category according to ISO 13849-1	Cat. 3	Cat. 3	
• SILCL according to IEC 62061	SILCL 2	SILCL 2	
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C	-25 °C	-25 °C
• max.	55 °C	55 °C	55 °C
Connection method			
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole	M8, 4-pole
ET-Connection			
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded
Dimensions			
Width	30 mm	30 mm	45 mm
Height	159 mm	159 mm	159 mm
Depth	40 mm	40 mm	40 mm
Weights			
Weight, approx.	145 g	145 g	195 g

Ordering data	Article No.	Ordering data	Article No.
Digital input modules		Power cable M8	
DI 8X24VDC, 8XM8	6ES7141-5BF00-0BA0	4-pin	
DI 8X24VDC, 4XM12	6ES7141-5AF00-0BA0	Pre-assembled at both ends, M8 connector and M8 socket	
DI 16X24VDC, 8XM12	6ES7141-5AH00-0BA0	0.19 m	6ES7194-2LH02-1AA0
Digital output modules		0.3 m	6ES7194-2LH03-1AA0
DQ 8X24VDC/2A, 8XM12	6ES7142-5AF00-0BA0	1 m	6ES7194-2LH10-1AA0
Digital input/output modules		2 m	6ES7194-2LH20-1AA0
4 DIQ / 4 DQ, 24 V DC, 0.5 A	6ES7143-5BF00-0BA0	5 m	6ES7194-2LH50-1AA0
DIQ 4+DQ 4X24VDC/0.5A, 4XM12	6ES7143-5AF00-0BA0	10 m	6ES7194-2LN10-1AA0
DIQ 16X24VDC/0.5A, 8XM12	6ES7143-5AH00-0BA0	15 m	6ES7194-2LN15-1AA0
Accessories		Pre-assembled at both ends, angled M8 connector and angled M8 socket	
Bus cable for backplane bus (ET connection)		0.3 m	6ES7194-2LH03-1AB0
4-pin, shielded		1 m	6ES7194-2LH10-1AB0
Pre-assembled at both ends, 2 M8 connectors		2 m	6ES7194-2LH20-1AB0
0.19 m	6ES7194-2LH02-0AA0	5 m	6ES7194-2LH50-1AB0
0.3 m	6ES7194-2LH03-0AA0	10 m	6ES7194-2LN10-1AB0
1 m	6ES7194-2LH10-0AA0	15 m	6ES7194-2LN15-1AB0
2 m	6ES7194-2LH20-0AA0	Pre-assembled at one end, M8 socket	
5 m	6ES7194-2LH50-0AA0	2 m	6ES7194-2LH20-1AC0
10 m	6ES7194-2LN10-0AA0	5 m	6ES7194-2LH50-1AC0
15 m	6ES7194-2LN15-0AA0	10 m	6ES7194-2LN10-1AC0
Pre-assembled at both ends, two M8 connectors, angled		15 m	6ES7194-2LN15-1AC0
0.3 m	6ES7194-2LH03-0AB0	M8 connector for ET connection	
1 m	6ES7194-2LH10-0AB0	4-pin, shielded	
2 m	6ES7194-2LH20-0AB0	M8 power connector	
5 m	6ES7194-2LH50-0AB0	Male contact insert, 4-pin	
10 m	6ES7194-2LN10-0AB0	Female contact insert, 4-pin	
15 m	6ES7194-2LN15-0AB0	ET connection FastConnect stripping tool	
Pre-assembled at one end, one M8 connector		Stripping tool for stripping the ET connection bus cable	
2 m	6ES7194-2LH20-0AC0	Labels	
5 m	6ES7194-2LH50-0AC0	10 x 5 mm, RAL 9016; 5 frames with 40 labels each	
10 m	6ES7194-2LN10-0AC0		
15 m	6ES7194-2LN15-0AC0		

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

I/O modules > Analog I/O modules

Overview

- 30-mm wide module with parameters and diagnostic functions
- For connecting analog actuators and sensors without additional amplifiers
- 4-channel analog input module with M12 connection
- 4-channel analog output module with M12 connection

Technical specifications

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4xU/I/RTD, 4xM12
General information	
Product type designation	AI 4xU/I/RTD
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3
• 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
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	35 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

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
• 1 V to 5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Input ranges (rated values), resistance thermometer	
• Ni 100	Yes; Standard/climate
• Pt 100	Yes; Standard/climate
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
Cable length	
• shielded, max.	30 m

Technical specifications (continued)

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4xU/I/RTD, 4xM12
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
• Interference voltage suppression for interference frequency f1 in Hz	3 600 / 60 / 50 / 16.7
• Conversion time (per channel)	2 / 18 / 21 / 61 ms
Smoothing of measured values	
• parameterizable	Yes
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
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 range), (+/-)	0.01 %
Operational error limit in overall temperature range	
• Voltage, relative to input range, (+/-)	0.35 %
• Current, relative to input range, (+/-)	0.45 %
• Resistance, relative to input range, (+/-)	0.25 %
• Resistance thermometer, relative to input range, (+/-)	0.25 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.25 %
• Current, relative to input range, (+/-)	0.25 %
• Resistance, relative to input range, (+/-)	0.15 %
• Resistance thermometer, relative to input range, (+/-)	0.15 %
Interference voltage suppression for $f = n \times (f1 \pm 0.5 \%)$, $f1 =$ interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4xU/I/RTD, 4xM12
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
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS02
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	30 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	168 g

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

I/O modules > Analog I/O modules

Technical specifications (continued)

Article number	6ES7145-5ND00-0BA0 ET 200AL, AQ 4xU/I, 4xM12
General information	
Product type designation	AQ 4xU/I
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	STEP 7 V14 or higher
• STEP 7 configurable/integrated as of version	V5.5 SP4 Hotfix 7 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
• Reverse polarity protection	Yes; Against destruction; actuator power supply outputs applied with reversed polarity
Input current	
Current consumption (rated value) from load voltage 1L+ (unswitched voltage)	110 mA; without load 4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Actuator supply	
Number of outputs	4
Short-circuit protection	Yes; per module, electronic
Output current	
• Rated value	Total current 1 A up to 45 °C; 0.5 A up to 55 °C
Analog outputs	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	24 mA
Current output, no-load voltage, max.	15 V
Cycle time (all channels) max.	1 ms
Output ranges, voltage	
• 0 to 10 V	Yes; 15 bit
• 1 V to 5 V	Yes; 14 bit
• -10 V to +10 V	Yes; 16 bit incl. sign
Output ranges, current	
• 0 to 20 mA	Yes; 15 bit
• -20 mA to +20 mA	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 14 bit
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 kΩ
• with voltage outputs, capacitive load, max.	1 μF
• with current outputs, max.	500 Ω
• with current outputs, inductive load, max.	1 mH

Article number	6ES7145-5ND00-0BA0 ET 200AL, AQ 4xU/I, 4xM12
Cable length	
• shielded, max.	30 m
Settling time	
• for resistive load	1 ms
• for capacitive load	1 ms
• for inductive load	1 ms
Errors/accuracies	
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %
Linearity error (relative to output range), (+/-)	0.1 %
Temperature error (relative to output range), (+/-)	0.005 %/K
Crosstalk between the outputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.03 %
Operational error limit in overall temperature range	
• Voltage, relative to output range, (+/-)	0.25 %
• Current, relative to output range, (+/-)	0.25 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to output range, (+/-)	0.15 %
• Current, relative to output range, (+/-)	0.15 %
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; channel by channel, parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Wire-break	Yes; channel-by-channel, only for output type "current"
• Short-circuit	Yes; Actuator supply module by module; channel by channel for output type "voltage"
Diagnostics indication LED	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C

Technical specifications (continued)

Article number	6ES7145-5ND00-0BA0 ET 200AL, AQ 4xU/I, 4xM12
Connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded

Article number	6ES7145-5ND00-0BA0 ET 200AL, AQ 4xU/I, 4xM12
Dimensions	
Width	30 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	175 g

Ordering data

Ordering data	Article No.	Ordering data	Article No.
Analog input modules		Power cable M8	
AI 4xU/I/RTD, 4xM12	6ES7144-5KD00-0BA0	4-pin	
AQ 4xU/I, 4xM12	6ES7145-5ND00-0BA0	Pre-assembled at both ends, M8 connector and M8 socket	
Accessories		0.19 m	6ES7194-2LH02-1AA0
Bus cable for backplane bus (ET connection)		0.3 m	6ES7194-2LH03-1AA0
4-pin, shielded		1 m	6ES7194-2LH10-1AA0
Pre-assembled at both ends, 2 M8 connectors		2 m	6ES7194-2LH20-1AA0
0.19 m	6ES7194-2LH02-0AA0	5 m	6ES7194-2LH50-1AA0
0.3 m	6ES7194-2LH03-0AA0	10 m	6ES7194-2LN10-1AA0
1 m	6ES7194-2LH10-0AA0	15 m	6ES7194-2LN15-1AA0
2 m	6ES7194-2LH20-0AA0	Pre-assembled at both ends, angled M8 connector and angled M8 socket	
5 m	6ES7194-2LH50-0AA0	0.3 m	6ES7194-2LH03-1AB0
10 m	6ES7194-2LN10-0AA0	1 m	6ES7194-2LH10-1AB0
15 m	6ES7194-2LN15-0AA0	2 m	6ES7194-2LH20-1AB0
Pre-assembled at both ends, 2 M8 connectors, angled		5 m	6ES7194-2LH50-1AB0
0.3 m	6ES7194-2LH03-0AB0	10 m	6ES7194-2LN10-1AB0
1 m	6ES7194-2LH10-0AB0	15 m	6ES7194-2LN15-1AB0
2 m	6ES7194-2LH20-0AB0	Pre-assembled at one end, M8 socket	
5 m	6ES7194-2LH50-0AB0	2 m	6ES7194-2LH20-1AC0
10 m	6ES7194-2LN10-0AB0	5 m	6ES7194-2LH50-1AC0
15 m	6ES7194-2LN15-0AB0	10 m	6ES7194-2LN10-1AC0
Pre-assembled at one end, 1 M8 connector		15 m	6ES7194-2LN15-1AC0
2 m	6ES7194-2LH20-0AC0	M8 connector for ET connection	6ES7194-2AB00-0AA0
5 m	6ES7194-2LH50-0AC0	4-pin, shielded	
10 m	6ES7194-2LN10-0AC0	M8 power connector	
15 m	6ES7194-2LN15-0AC0	Male contact insert, 4-pin	6ES7194-2AA00-0AA0
		Female contact insert, 4-pin	6ES7194-2AC00-0AA0
		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

SIMATIC 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 S7-PCT Port Configuration Tool, V3.2 and higher.

Technical specifications

Article number	6ES7147-5JD00-0BA0 ET 200AL, CM 4x IO-Link, 4xM12
General information	
Product type designation	CM 4x IO-Link
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3
• 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
• Reverse polarity protection	Yes
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; load increasing
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.	1.4 A; Total current of all ports

Article number	6ES7147-5JD00-0BA0 ET 200AL, CM 4x IO-Link, 4xM12
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)
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
Master backup	Possible with function block IO_LINK_MASTER
Configuration without S7-PCT	Possible; autostart/manual function
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	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
• For load voltage monitoring	Yes; Green LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67

Article number	6ES7147-5JD00-0BA0 ET 200AL, CM 4x IO-Link, 4xM12
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	30 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	145 g

I/O SystemsSIMATIC 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**CM 4X IO-Link, 4XM12;
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

0.19 m

6ES7194-2LH02-0AA0

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

15 m

6ES7194-2LN15-0AA0Pre-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

6ES7194-2LN10-0AB0

15 m

6ES7194-2LN15-0AB0Pre-assembled at one end,
1 M8 connector

2 m

6ES7194-2LH20-0AC0

5 m

6ES7194-2LH50-0AC0

10 m

6ES7194-2LN10-0AC0

15 m

6ES7194-2LN15-0AC0**Power cable M8**

4-pin

Pre-assembled at both ends,
M8 connector and M8 socket

0.19 m

6ES7194-2LH02-1AA0

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

15 m

6ES7194-2LN15-1AA0Pre-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

6ES7194-2LN10-1AB0

15 m

6ES7194-2LN15-1AB0Pre-assembled at one end,
M8 socket

2 m

6ES7194-2LH20-1AC0

5 m

6ES7194-2LH50-1AC0

10 m

6ES7194-2LN10-1AC0

15 m

6ES7194-2LN15-1AC0**M8 connector for ET connection****6ES7194-2AB00-0AA0**

4-pin, shielded

M8 power connector

Male contact insert, 4-pin

6ES7194-2AA00-0AA0

Female contact insert, 4-pin

6ES7194-2AC00-0AA0**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	6ES7194-2LH02-0AA0	6ES7194-2LH03-0AA0	6ES7194-2LH10-0AA0	6ES7194-2LH20-0AA0
	Bus cable for ET connection, 0.19m	Bus cable for ET connection, 0.3m	Bus cable for ET connection, 1.0M	Bus cable for ET connection, 2.0M
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
Suitability for use	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 acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	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
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
Cable length	0.19 m	0.3 m	1 m	2 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	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
Outer diameter of cable sheath	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
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	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
Weight per length	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
Material of housing	metal	metal	metal	metal
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes

I/O SystemsSIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL**Accessories > Cables and connectors****Technical specifications** (continued)

Article number	6ES7194-2LH50-0AA0	6ES7194-2LN10-0AA0	6ES7194-2LN15-0AA0
	Bus cable for ET connection, 5.0M	Bus cable for ET connection, 10m	Bus cable for ET connection, 15m
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
Suitability for use	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 acc. 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
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	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
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
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
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	
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 cable sheath	PVC	PVC	PVC
Material of core insulation	PE	PE	PE
Material property			
• Halogen-free	No	No	No
• Silicone-free	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7194-2MH02-0AA0	6ES7194-2MH03-0AA0	6ES7194-2MH10-0AA0	6ES7194-2MH20-0AA0
	Bus cable for ET connection, 0.19m	Bus cable for ET connection, 0.3m	Bus cable for ET connection, 1.0M	Bus cable for ET connection, 2.0M
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
Suitability for use	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 acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
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
Cable length	0.19 m	0.3 m	1 m	2 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	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
Outer diameter of cable sheath	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
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	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
Weight per length	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
Material of housing	metal	metal	metal	metal
Material of cable sheath	PUR	PUR	PUR	PUR
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes

I/O SystemsSIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL**Accessories > Cables and connectors****Technical specifications** (continued)

Article number	6ES7194-2MH50-0AA0	6ES7194-2MN10-0AA0	6ES7194-2MN15-0AA0
	Bus cable for ET connection, 5.0M	Bus cable for ET connection, 10m	Bus cable for ET connection, 15m
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
Suitability for use	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 acc. 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
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
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
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
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 cable sheath	PUR	PUR	PUR
Material of core insulation	PE	PE	PE
Material property			
• Halogen-free	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7194-2LH03-0AB0	6ES7194-2LH10-0AB0	6ES7194-2LH20-0AB0
	Bus cable for ET connection, angled, 0.3m	Bus cable for ET connection, angled, 1.0M	Bus cable for ET connection, angled, 2.0M
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
Suitability for use	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 acc. 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
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	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
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
Cable length	0.3 m	1 m	2 m
Number of electrical cores	4	4	4
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	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	metal	metal	metal
Material of cable sheath	PVC	PVC	PVC
Material of core insulation	PE	PE	PE
Material property			
• Halogen-free	No	No	No
• Silicone-free	Yes	Yes	Yes

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

Accessories > Cables and connectors

Technical specifications (continued)

Article number	6ES7194-2LH50-0AB0	6ES7194-2LN10-0AB0	6ES7194-2LN15-0AB0
	Bus cable for ET connection, angled, 5.0M	Bus cable for ET connection, angled, 10m	Bus cable for ET connection, angled, 15m
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
Suitability for use	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 acc. 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
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	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
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
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
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	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	metal	metal	metal
Material of cable sheath	PVC	PVC	PVC
Material of core insulation	PE	PE	PE
Material property			
• Halogen-free	No	No	No
• Silicone-free	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7194-2MH03-0AB0	6ES7194-2MH10-0AB0	6ES7194-2MH20-0AB0
	Bus cable for ET connection, angled, 0.3m	Bus cable for ET connection, angled, 1.0M	Bus cable for ET connection, angled, 2.0M
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
Suitability for use	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 acc. 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
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
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
Cable length	0.3 m	1 m	2 m
Number of electrical cores	4	4	4
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	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	metal	metal	metal
Material of cable sheath	PUR	PUR	PUR
Material of core insulation	PE	PE	PE
Material property			
• Halogen-free	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes

I/O SystemsSIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL**Accessories > Cables and connectors****Technical specifications (continued)**

Article number	6ES7194-2MH50-0AB0	6ES7194-2MN10-0AB0	6ES7194-2MN15-0AB0
	Bus cable for ET connection, angled, 5.0M	Bus cable for ET connection, angled, 10m	Bus cable for ET connection, angled, 15m
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
Suitability for use	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 acc. 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
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
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
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
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	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	metal	metal	metal
Material of cable sheath	PUR	PUR	PUR
Material of core insulation	PE	PE	PE
Material property			
• Halogen-free	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7194-2LH20-0AC0	6ES7194-2LH50-0AC0	6ES7194-2LN10-0AC0	6ES7194-2LN15-0AC0
	Bus cable for ET connection, 2.0M	Bus cable for ET connection, 5.0M	Bus cable for ET connection, 10m	Bus cable for ET connection, 15m
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	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Suitability for use	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 acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	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
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
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	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
Outer diameter of cable sheath	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	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	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
Weight per length	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
Material of housing	metal	metal	metal	metal
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

Accessories > Cables and connectors

Technical specifications (continued)

Article number	6ES7194-2MH20-0AC0	6ES7194-2MH50-0AC0	6ES7194-2MN10-0AC0	6ES7194-2MN15-0AC0
	Bus cable for ET connection, 2.0M	Bus cable for ET connection, 5.0M	Bus cable for ET connection, 10m	Bus cable for ET connection, 15m
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	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Suitability for use	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 acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
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
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	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
Outer diameter of cable sheath	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	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	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
Weight per length	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
Material of housing	metal	metal	metal	metal
Material of cable sheath	PUR	PUR	PUR	PUR
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7194-2LH02-1AA0	6ES7194-2LH03-1AA0	6ES7194-2LH10-1AA0	6ES7194-2LH20-1AA0
	Power Cable M8, 0.19m	Power Cable M8, 0.3m	Power Cable M8, 1.0M	Power Cable M8, 2.0M
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
Suitability for use	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 acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y
Cable length	0.19 m	0.3 m	1 m	2 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	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
Outer diameter of cable sheath	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
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	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
Weight per length	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
Material of housing	plastic	plastic	plastic	plastic
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PP	PP	PP	PP
Material property				
• Silicone-free	Yes	Yes	Yes	Yes

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

Accessories > Cables and connectors

Technical specifications (continued)

Article number	6ES7194-2LH50-1AA0	6ES7194-2LN10-1AA0	6ES7194-2LN15-1AA0
	Power Cable M8, 5.0M	Power Cable M8, 10m	Power Cable M8, 15m
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
Suitability for use	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 acc. 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
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y
Cable length	5 m	10 m	15 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 cable sheath	PVC	PVC	PVC
Material of core insulation	PP	PP	PP
Material property			
• Silicone-free	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7194-2MH50-1AA0	6ES7194-2MN10-1AA0	6ES7194-2MN15-1AA0
	Power Cable M8, 5.0M	Power Cable M8, 10m	Power Cable M8, 15m
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
Suitability for use	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 acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	LIF9Y11YFHF 4x0.50 mm ²	LIF9Y11YFHF 4x0.50 mm ²	LIF9Y11YFHF 4x0.50 mm ²
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm
Number of bending cycles	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 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 cable sheath	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP
Material property			
• Halogen-free	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes

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SIMATIC ET 200AL**Accessories > Cables and connectors****Technical specifications** (continued)

Article number	6ES7194-2LH03-1AB0	6ES7194-2LH10-1AB0	6ES7194-2LH20-1AB0
	Power Cable M8, angled, 0.3m	Power Cable M8, angled, 1.0M	Power Cable M8, angled, 2.0M
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
Suitability for use	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 acc. 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
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y
Cable length	0.3 m	1 m	2 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	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	plastic	plastic	plastic
Material of cable sheath	PVC	PVC	PVC
Material of core insulation	PP	PP	PP
Material property			
• Silicone-free	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7194-2LH50-1AB0	6ES7194-2LN10-1AB0	6ES7194-2LN15-1AB0
	Power Cable M8, angled, 5.0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m
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
Suitability for use	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 acc. 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
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y
Cable length	5 m	10 m	15 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	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	plastic	plastic	plastic
Material of cable sheath	PVC	PVC	PVC
Material of core insulation	PP	PP	PP
Material property			
• Silicone-free	Yes	Yes	Yes

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SIMATIC ET 200AL**Accessories > Cables and connectors****Technical specifications (continued)**

Article number	6ES7194-2MH50-1AB0	6ES7194-2MN10-1AB0	6ES7194-2MN15-1AB0
	Power Cable M8, angled, 5.0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m
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
Suitability for use	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 acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	LIF9Y11YFHF 4x0.50 mm ²	LIF9Y11YFHF 4x0.50 mm ²	LIF9Y11YFHF 4x0.50 mm ²
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm
Number of bending cycles	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 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	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	plastic	plastic	plastic
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP
Material property			
• Halogen-free	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7194-2MH03-1AB0	6ES7194-2MH10-1AB0	6ES7194-2MH20-1AB0
	Power Cable M8, angled, 0.3m	Power Cable M8, angled, 1.0M	Power Cable M8, angled, 2.0M
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
Suitability for use	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 acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	LIF9Y11YFHF 4x0.50 mm ²	LIF9Y11YFHF 4x0.50 mm ²	LIF9Y11YFHF 4x0.50 mm ²
Cable length	0.3 m	1 m	2 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm
Number of bending cycles	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 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	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	plastic	plastic	plastic
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP
Material property			
• Halogen-free	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes

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SIMATIC ET 200AL**Accessories > Cables and connectors****Technical specifications (continued)**

Article number	6ES7194-2LH20-1AC0	6ES7194-2LH50-1AC0	6ES7194-2LN10-1AC0	6ES7194-2LN15-1AC0
	Power Cable M8, 2.0M	Power Cable M8, 5.0M	Power Cable M8, 10m	Power Cable M8, 15m
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	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Suitability for use	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 acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	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
Outer diameter of cable sheath	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
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	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
Weight per length	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
Material of housing	plastic	plastic	plastic	plastic
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PP	PP	PP	PP
Material property				
• Silicone-free	Yes	Yes	Yes	Yes

Technical specifications (continued)

Article number	6ES7194-2MH20-1AC0	6ES7194-2MH50-1AC0	6ES7194-2MN10-1AC0	6ES7194-2MN15-1AC0
	Power Cable M8, 2.0M	Power Cable M8, 5.0M	Power Cable M8, 10m	Power Cable M8, 15m
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 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector
Suitability for use	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 acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-25 °C	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	LIF9Y11YFHF 4x0.50 mm ²	LIF9Y11YFHF 4x0.50 mm ²	LIF9Y11YFHF 4x0.50 mm ²	LIF9Y11YFHF 4x0.50 mm ²
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm	5.1 mm
Number of bending cycles	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm	51 mm
Color of cable sheath	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
Weight per length	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
Material of housing	plastic	plastic	plastic	plastic
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP	PP
Material property				
• Halogen-free	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes

I/O Systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

Accessories > Cables and connectors

Technical specifications (continued)

Article number	6ES7194-2AA00-0AA0 M8 Power Connector	6ES7194-2AC00-0AA0 M8 Power Connector, Socket
General information		
Product type designation	Power connector	Power connector
Product description	M8 plug connector with high degree of protection, 4-pin, plastic version	M8 plug connector with high degree of protection, socket insert, 4-pin, plastic version
Suitability for use	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 acc. to EN 60529		
• IP65	Yes	Yes
• IP67	Yes	Yes
Ambient conditions		
Ambient temperature during assembly, min.	-30 °C	-30 °C
Ambient temperature during assembly, max.	85 °C	85 °C
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	85 °C	85 °C
Mechanics/material		
Type of cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	plastic	plastic
Dimensions		
Width	14 mm	14 mm
Depth	47 mm	47 mm

Article number	6ES7194-2AB00-0AA0 M8 Connector ET-Connection
General information	
Product type designation	Connector
Product description	M8 plug connector with high degree of protection, 4-pin, metal version for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Suitability for use	
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP65	Yes
• IP67	Yes

Article number	6ES7194-2AB00-0AA0 M8 Connector ET-Connection
Ambient conditions	
Ambient temperature during assembly, min.	-30 °C
Ambient temperature during assembly, max.	80 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	80 °C
Mechanics/material	
Type of cable outlet	180 degree cable outlet
Material of housing	metal
Dimensions	
Width	14 mm
Depth	47 mm

Ordering data

Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends, 2 M8 connectors

	Article No.
0.19 m	6ES7194-2LH02-0AA0
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
15 m	6ES7194-2LN15-0AA0

PUR line, pre-assembled at both ends, 2 M8 connectors

	Article No.
0.19 m	6ES7194-2MH02-0AA0
0.3 m	6ES7194-2MH03-0AA0
1 m	6ES7194-2MH10-0AA0
2 m	6ES7194-2MH20-0AA0
5 m	6ES7194-2MH50-0AA0
10 m	6ES7194-2MN10-0AA0
15 m	6ES7194-2MN15-0AA0

Ordering data	Article No.	Article No.	
Bus cable for backplane bus (ET connection) (continued)			
PUR line, pre-assembled at both ends, 2 M8 connectors, angled		PUR line, pre-assembled at both ends, M8 connector and M8 socket	
0.3 m	6ES7194-2MH03-0AB0	0.19 m	6ES7194-2MH02-1AA0
1 m	6ES7194-2MH10-0AB0	0.3 m	6ES7194-2MH03-1AA0
2 m	6ES7194-2MH20-0AB0	1 m	6ES7194-2MH10-1AA0
5 m	6ES7194-2MH50-0AB0	2 m	6ES7194-2MH20-1AA0
10 m	6ES7194-2MN10-0AB0	5 m	6ES7194-2MH50-1AA0
15 m	6ES7194-2MN15-0AB0	10 m	6ES7194-2MN10-1AA0
Pre-assembled at both ends, 2 M8 connectors, angled		15 m	6ES7194-2MN15-1AA0
0.3 m	6ES7194-2LH03-0AB0	Pre-assembled at both ends, angled M8 connector and angled M8 socket	
1 m	6ES7194-2LH10-0AB0	0.3 m	6ES7194-2LH03-1AB0
2 m	6ES7194-2LH20-0AB0	1 m	6ES7194-2LH10-1AB0
5 m	6ES7194-2LH50-0AB0	2 m	6ES7194-2LH20-1AB0
10 m	6ES7194-2LN10-0AB0	5 m	6ES7194-2LH50-1AB0
15 m	6ES7194-2LN15-0AB0	10 m	6ES7194-2LN10-1AB0
Pre-assembled at one end, 1 M8 connector		15 m	6ES7194-2LN15-1AB0
2 m	6ES7194-2LH20-0AC0	PUR line, pre-assembled at both ends, angled M8 connector and angled M8 socket	
5 m	6ES7194-2LH50-0AC0	0.3 m	6ES7194-2MH03-1AB0
10 m	6ES7194-2LN10-0AC0	1 m	6ES7194-2MH10-1AB0
15 m	6ES7194-2LN15-0AC0	2 m	6ES7194-2MH20-1AB0
PUR line, pre-assembled at one end, 1 M8 connector		5 m	6ES7194-2MH50-1AB0
2 m	6ES7194-2MH20-0AC0	10 m	6ES7194-2MN10-1AB0
5 m	6ES7194-2MH50-0AC0	15 m	6ES7194-2MN15-1AB0
10 m	6ES7194-2MN10-0AC0	Pre-assembled at one end, M8 socket	
15 m	6ES7194-2MN15-0AC0	2 m	6ES7194-2LH20-1AC0
Connecting cable for bus cable for backplane bus (ET connection)		5 m	6ES7194-2LH50-1AC0
4-pin, shielded		10 m	6ES7194-2LN10-1AC0
Pre-assembled at both ends, 2 M8 connectors. 0.2 m	6ES7194-2LH02-0AD0	15 m	6ES7194-2LN15-1AC0
PUR line, pre-assembled at both ends, 2 M8 connectors. 0.2 m	6ES7194-2MH02-0AD0	PUR line, pre-assembled at one end, M8 socket	
Power cable M8		2 m	6ES7194-2MH20-1AC0
4-pin		5 m	6ES7194-2MH50-1AC0
Pre-assembled at both ends, M8 connector and M8 socket		10 m	6ES7194-2MN10-1AC0
0.19 m	6ES7194-2LH02-1AA0	15 m	6ES7194-2MN15-1AC0
0.3 m	6ES7194-2LH03-1AA0	M8 connector for ET connection	6ES7194-2AB00-0AA0
1 m	6ES7194-2LH10-1AA0	4-pin, shielded	
2 m	6ES7194-2LH20-1AA0	M8 power connector	
5 m	6ES7194-2LH50-1AA0	Male contact insert, 4-pin	6ES7194-2AA00-0AA0
10 m	6ES7194-2LN10-1AA0	Female contact insert, 4-pin	6ES7194-2AC00-0AA0
15 m	6ES7194-2LN15-1AA0	ET connection FastConnect stripping tool	6ES7194-2KA00-0AA0
		Stripping tool for stripping the ET connection bus cable	

I/O Systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

Accessories > Labels

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

Overview



- Compact block I/O for processing digital, fail-safe digital, analog and IO-Link signals for connecting to the PROFINET bus system
- Cabinet-free design in IP65/66/67 degree of protection with M12 connections
- Extremely rugged and resistant metal enclosure 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 and fail-safe 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 Mbps
- 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 F-DI/3 F-DO (2 A)
 - 8 AI (U, I, TC, RTD)
 - 8 AI (TC, RTD)
 - 4 AO (U, I)
 - 4 IO-Link
 - 4 IO-Link + 8 DI + 4 DO (1.3 A)
- Channel-specific diagnostics
- Ambient temperature range -40 °C to 60 °C

Technical specifications

Article number	6ES7141-6BF00-0AB0	6ES7141-6BG00-0AB0	6ES7141-6BH00-0AB0
	ET200eco PN, 8DI, 24VDC, 4xM12	ET200eco PN, 8DI, 24VDC, 8xM12	ET200eco PN, 16DI, 24VDC, 8xM12
Supply voltage			
Rated value (DC)	24 V	24 V	24 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
24 V encoder supply			
• Short-circuit protection	Yes; Electronic	Yes; Electronic	Yes; Electronic
• Output current, max.	100 mA; per output	100 mA; per output	100 mA; per output
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			
• 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 "1", typ.	7 mA	7 mA	7 mA
Cable length			
• unshielded, max.	30 m	30 m	30 m

I/O Systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Technical specifications (continued)

Article number	6ES7141-6BF00-0AB0 ET200eco PN, 8DI, 24VDC, 4xM12	6ES7141-6BG00-0AB0 ET200eco PN, 8DI, 24VDC, 8xM12	6ES7141-6BH00-0AB0 ET200eco PN, 16DI, 24VDC, 8xM12
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
Interfaces			
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1	1
1. Interface			
Interface types			
• integrated switch	Yes	Yes	Yes
• M12 port	Yes	Yes	Yes
Interface types			
M12 port			
• Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
Protocols			
Supports protocol for PROFINET IO	Yes	Yes	Yes
PROFINET CBA	No	No	No
PROFIsafe	No	No	No
PROFINET IO Device			
Services			
- IRT with the option "high flexibility"	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
Open IE communication			
• TCP/IP	No	No	No
• SNMP	Yes	Yes	Yes
• DCP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
• ping	Yes	Yes	Yes
• ARP	Yes	Yes	Yes
Interrupts/diagnostics/ status information			
Diagnostics function	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnostic messages			
• 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
Potential separation			
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
Potential separation channels			
• between the channels	No	No	No

Technical specifications (continued)

Article number	6ES7141-6BF00-0AB0 ET200eco PN, 8DI, 24VDC, 4xM12	6ES7141-6BG00-0AB0 ET200eco PN, 8DI, 24VDC, 8xM12	6ES7141-6BH00-0AB0 ET200eco PN, 16DI, 24VDC, 8xM12		
Degree and class of protection					
IP degree of protection	IP65/67	IP67	IP67		
Connection method					
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors		
Dimensions					
Width	30 mm	60 mm	60 mm		
Height	200 mm	175 mm	175 mm		
Depth	49 mm	49 mm	49 mm		
Weights					
Weight, approx.	550 g	910 g	910 g		
Article number	6ES7142-6BF50-0AB0 ET200eco PN, 8DO, 24VDC/0.5A, 4xM12	6ES7142-6BF00-0AB0 ET200eco PN, 8DO, 24VDC/1.3A, 4xM12	6ES7142-6BG00-0AB0 ET200eco PN, 8DO, 24VDC/1.3A, 8xM12	6ES7142-6BR00-0AB0 ET200eco PN, 8 DO, 24VDC/2A, 8xM12	6ES7142-6BH00-0AB0 ET200eco PN, 16DO 24VDC/1.3A, 8xM12
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 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
• Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Input current					
Current consumption, typ.	100 mA	100 mA	100 mA	100 mA	100 mA
from supply voltage 1L+, max.	4 A	4 A	4 A	4 A	4 A
from load voltage 2L+, max.	4 A	4 A	4 A	4 A	4 A
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
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 two outputs					
• for uprating	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
Total current of the 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

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Technical specifications (continued)

Article number	6ES7142-6BF50-0AB0 ET200eco PN, 8DO, 24VDC/0.5A, 4xM12	6ES7142-6BF00-0AB0 ET200eco PN, 8DO, 24VDC/1.3A, 4xM12	6ES7142-6BG00-0AB0 ET200eco PN, 8DO, 24VDC/1.3A, 8xM12	6ES7142-6BR00-0AB0 ET200eco PN, 8 DO, 24VDC/2A, 8xM12	6ES7142-6BH00-0AB0 ET200eco PN, 16DO 24VDC/1.3A, 8xM12
Interfaces					
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1	1	1	1
1. Interface					
Interface types					
• integrated switch	Yes	Yes	Yes	Yes	Yes
• M12 port		Yes			
Interface types					
M12 port					
• Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX
• Autonegotiation	Yes	Yes	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s	100 Mbit/s	100 Mbit/s
Protocols					
Supports protocol for PROFINET IO	Yes	Yes	Yes	Yes	Yes
PROFINET CBA	No	No	No	No	No
PROFIsafe	No	No	No	No	No
PROFINET IO Device					
Services					
- IRT with the option "high flexibility"	Yes	Yes	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes	Yes	Yes
Open IE communication					
• TCP/IP	No	No	No	No	No
• 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					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostic messages					
• 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
Potential separation					
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
Potential separation channels					
• between the channels	No	No	No	No	No
Degree and class of protection					
IP degree of protection	IP67	IP65/67	IP67	IP67	IP67

Technical specifications (continued)

Article number	6ES7142-6BF50-0AB0 ET200eco PN, 8DO, 24VDC/0.5A, 4xM12	6ES7142-6BF00-0AB0 ET200eco PN, 8DO, 24VDC/1.3A, 4xM12	6ES7142-6BG00-0AB0 ET200eco PN, 8DO, 24VDC/1.3A, 8xM12	6ES7142-6BR00-0AB0 ET200eco PN, 8 DO, 24VDC/2A, 8xM12	6ES7142-6BH00-0AB0 ET200eco PN, 16DO 24VDC/1.3A, 8xM12
Standards, approvals, certificates					
Suitable for safety-related tripping of standard modules	Yes	Yes	Yes	Yes	Yes
Highest safety class achievable for safety-related tripping of standard modules					
• Performance level according to ISO 13849-1	PL d	PL d	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2	SILCL 2	SILCL 2
Connection method					
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
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, approx.	550 g	550 g	910 g	910 g	910 g
Article number					
	6ES7147-6BG00-0AB0 ET200eco PN, 8 DIO, 24VDC/1.3A, 8xM12		6ES7146-6FF00-0AB0 ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A		
Engineering with					
• STEP 7 TIA Portal configurable/integrated as of version			V15 with HSP 204		
Operating mode					
• DI			Yes		
• DQ			Yes		
Supply voltage					
Rated value (DC)	24 V		24 V		
Reverse polarity protection	Yes		Yes		
Load voltage 1L+					
• Rated value (DC)			24 V		
• Reverse polarity protection			Yes		
Load voltage 2L+					
• Rated value (DC)	24 V		24 V		
• Reverse polarity protection	Yes		Yes		
Input current					
Current consumption, typ.	100 mA		200 mA		
from supply voltage 1L+, max.	4 A		4 A		
from load voltage 2L+, max.	4 A		4 A		
Encoder supply					
Number of outputs	8		2		
24 V encoder supply					
• Short-circuit protection	Yes; Electronic		Yes; Electronic		
• Output current, max.	100 mA; per output		300 mA; per output		

I/O Systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Technical specifications (continued)

Article number	6ES7147-6BG00-0AB0 ET200eco PN, 8 DIO, 24VDC/1.3A, 8xM12	6ES7146-6FF00-0AB0 ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
Digital inputs		
Number of digital inputs	8	8; 8 (one-channel); 4 (two-channel)
• in groups of	4	
Digital inputs, parameterizable		Yes
Input characteristic curve in accordance with IEC 61131, type 1		Yes
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	8
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-30 V DC to +5 V DC
• for signal "1"	+11 to +30V	15 V DC to 30 V DC
Input current		
• for signal "1", typ.	7 mA	
Input delay (for rated value of input voltage) for standard inputs		
- parameterizable		Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms
Cable length		
• unshielded, max.	30 m	30 m
Digital outputs		
Number of digital outputs	8	3
• in groups of	4	3
Short-circuit protection	Yes; Electronic	Yes; Electronic
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V	PM-switching: Typ. -26 V to (-48 V)
Controlling a digital input	Yes	No
Switching capacity of the outputs		
• on lamp load, max.	5 W	10 W
Output current		
• for signal "1" rated value	1.3 A; Maximum	2 A
• for signal "0" residual current, max.	1.5 mA	0.5 mA
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	Yes	No
Switching frequency		
• with resistive load, max.	100 Hz	30 Hz
• with inductive load, max.	0.5 Hz	0.1 Hz
• on lamp load, max.	1 Hz	10 Hz
Total current of the outputs (per group)		
all mounting positions		
- up to 60 °C, max.	3.9 A	3.9 A
Cable length		
• unshielded, max.	30 m	30 m
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	No
- permissible quiescent current (2-wire sensor), max.	1.5 mA	0.5 mA

Technical specifications (continued)

Article number	6ES7147-6BG00-0AB0	6ES7146-6FF00-0AB0
	ET200eco PN, 8 DIO, 24VDC/1.3A, 8xM12	ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1
1. Interface		
Interface types		
• integrated switch	Yes	Yes
• M12 port	Yes	Yes
Interface types		
M12 port		
• Transmission procedure	100BASE-TX	100BASE-TX
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET CBA	No	No
PROFIsafe	No	Yes
PROFINET IO Device		
Services		
- IRT with the option "high flexibility"	Yes	No; module will participate within an IRT topology
- Prioritized startup	Yes	No
Open IE communication		
• TCP/IP	No	No
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED
• Wire-break in actuator cable	Yes	Yes
• Wire-break in signal transmitter cable	Yes	Yes
• Short-circuit	Yes	Yes
• Short-circuit encoder supply	Yes	Yes
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
Potential separation		
between the load voltages	Yes	Yes
between load voltage and all other switching components	No	No
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	No
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67

I/O Systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Technical specifications (continued)

Article number	6ES7147-6BG00-0AB0 ET200eco PN, 8 DIO, 24VDC/1.3A, 8xM12	6ES7146-6FF00-0AB0 ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes	No
Highest safety class achievable in safety mode		
<ul style="list-style-type: none"> Performance level according to ISO 13849-1 SIL acc. to IEC 61508 SILCL according to IEC 62061 		PLe SIL 2 (single-channel), SIL 3 (two-channel) SIL 3
Highest safety class achievable for safety-related tripping of standard modules		
<ul style="list-style-type: none"> Performance level according to ISO 13849-1 Category according to ISO 13849-1 SILCL according to IEC 62061 	PL d Cat. 3 SILCL 2	
Ambient conditions		
Ambient temperature during operation		
<ul style="list-style-type: none"> min. max. 		-25 °C 60 °C
Connection method		
Design of electrical connection	4/5-pin M12 circular connectors	Connector
Dimensions		
Width	60 mm	60 mm
Height	175 mm	175 mm
Depth	49 mm	49 mm
Weights		
Weight, approx.	910 g	940 g
Article number	6ES7144-6KD00-0AB0 ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	6ES7144-6KD50-0AB0 ET200eco PN, 8AI RTD/TC 8xM12
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes; against destruction
Input current		
Current consumption, typ.	110 mA	110 mA
Encoder supply		
Number of outputs	4	
Analog inputs		
Number of analog inputs	8	8
<ul style="list-style-type: none"> For voltage/current measurement For resistance/resistance thermometer measurement 	4 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		
<ul style="list-style-type: none"> 0 to +10 V 1 V to 5 V -10 V to +10 V -80 mV to +80 mV 	Yes Yes Yes Yes	Yes
Input ranges (rated values), currents		
<ul style="list-style-type: none"> 0 to 20 mA -20 mA to +20 mA 4 mA to 20 mA 	Yes Yes Yes	

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
Input ranges (rated values), thermocouples		
• 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 Pt100		Yes
- external temperature compensation with compensations socket	Yes	Yes
- dynamic reference temperature value		Yes
- for definable comparison point temperature		Yes
Cable length		
• shielded, max.	30 m	30 m
Analog value generation for the inputs		
Analog value display	SIMATIC S7 format	SIMATIC S7 format
Measurement principle	integrating	integrating
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• 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

I/O Systems

SIMATIC ET 200 systems without control cabinet

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
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 range), (+/-)	0.008 %	0.008 %
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.	46 dB	46 dB
• Common mode interference, min.	70 dB	70 dB
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1
1. Interface		
Interface types		
• integrated switch	Yes	Yes
• M12 port	Yes	
Interface types		
M12 port		
• Transmission procedure	100BASE-TX	100BASE-TX
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET CBA	No	No
PROFIsafe	No	No
PROFINET IO Device		
Services		
- IRT with the option "high flexibility"	Yes	
- Prioritized startup	Yes	Yes
Open IE communication		
• TCP/IP	No	No
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes

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
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• 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
Potential separation		
between the load voltages	Yes	Yes
between load voltage and all other switching components	No	No
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	No
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Standards, approvals, certificates		
Suitable for applications according to AMS 2750	Yes; Declaration of Conformity, see online support entry 109757262	Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CCI-9	Yes; Based on AMS 2750 E	Yes; Based on AMS 2750 E
Connection method		
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Dimensions		
Width	60 mm	60 mm
Height	175 mm	175 mm
Depth	49 mm	49 mm
Weights		
Weight, approx.	930 g	930 g

Article number	6ES7145-6HD00-0AB0 ET200eco PN, 4AO U/I 4xM12
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Input current	
Current consumption, typ.	280 mA
Actuator supply	
Number of outputs	4
Short-circuit protection	Yes; Electronic at 1.4 A
Output current	
• Rated value	1 A; Maximum
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

Article number	6ES7145-6HD00-0AB0 ET200eco PN, 4AO U/I 4xM12
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
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 k Ω
• with voltage outputs, capacitive load, max.	1 μ F
• with current outputs, max.	600 Ω
• with current outputs, inductive load, max.	1 mH
Cable length	
• shielded, max.	30 m

I/O Systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Technical specifications (continued)

Article number	6ES7145-6HD00-0AB0 ET200eco PN, 4AO U/I 4xM12
Analog value generation for the outputs	
Analog value display	SIMATIC S7 format
Conversion principle	Resistor network
Integration and conversion time/ resolution per channel	
• Resolution (incl. overrange)	15 bit + sign
• Conversion time (per channel)	1 ms
Settling time	
• for resistive load	2 ms
• for capacitive load	1.8 ms
• for inductive load	2 ms
Errors/accuracies	
Output ripple (relative to output range, 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 range), (+/-)	0.008 %
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
1. Interface	
Interface types	
• integrated switch	Yes
• M12 port	Yes
Interface types	
M12 port	
• Transmission procedure	100BASE-TX
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFINET CBA	No
PROFIsafe	No
PROFINET IO Device	
Services	
- IRT with the option "high flexibility"	Yes
- Prioritized startup	Yes
Open IE communication	
• TCP/IP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes

Article number	6ES7145-6HD00-0AB0 ET200eco PN, 4AO U/I 4xM12
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• 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
Potential separation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No
Degree and class of protection	
IP degree of protection	IP65/67
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Dimensions	
Width	60 mm
Height	175 mm
Depth	49 mm
Weights	
Weight, approx.	930 g

Technical specifications (continued)

Article number	6ES7148-6JA00-0AB0 ET 200eco PN: IO-Link Master	6ES7148-6JD00-0AB0 ET 200eco PN: IO-Link Master
Supply voltage		
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; against destruction; load increasing
Input current		
Current consumption, typ.	200 mA	100 mA
from supply voltage 1L+, max.	4 A	4 A
from load voltage 2L+, max.	4 A	4 A
Encoder supply		
Number of outputs	6	4
24 V encoder supply		
• Short-circuit protection	Yes	Yes; per channel, electronic
• Output current, max.	200 mA; 100 mA per output to X5-X6	500 mA; Per channel
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	
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 two outputs		
• for uprating	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	

I/O Systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Technical specifications (continued)

Article number	6ES7148-6JA00-0AB0 ET 200eco PN: IO-Link Master	6ES7148-6JD00-0AB0 ET 200eco PN: IO-Link Master
Total current of the outputs (per group)		
all mounting positions		
- up to 60 °C, max.	3.9 A	
Cable length		
• unshielded, max.	30 m	
IO-Link		
Number of ports	4	4
• of which simultaneously controllable	4	4
IO-Link protocol 1.0	Yes	Yes
IO-Link protocol 1.1		Yes
Transmission rate	4.8 kBd (COM1); 38.4 kBd (COM2)	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Size of process data, input per port	32 byte	32 byte
Size of process data, input per module	32 byte	128 bytes + 4 bytes PQI
Size of process data, output per port	32 byte	32 byte
Size of process data, output per module	32 byte	128 byte
Memory size for device parameter Master backup		2 kbyte; for each port Possible with function block IO_LINK_MASTER
Configuration without S7-PCT		Possible; autostart/manual function
Cable length unshielded, max.	20 m	20 m
Operating modes		
• IO-Link	Yes	Yes
• DI	Yes	Yes
• DQ	Yes	Yes; max. 100 mA
Connection of IO-Link devices		
• Port type A	Yes	Yes; via 3-core cable
• Port type B		Yes; Additional device supply: max. 2 A per port, max. 4 A per module
• via three-wire connection	Yes	
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1
1. Interface		
Interface types		
• integrated switch	Yes	Yes
• M12 port	Yes	Yes
Interface types		
M12 port		
• Transmission procedure	100BASE-TX	
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET CBA	No	No
PROFIsafe	No	No
PROFINET IO Device		
Services		
- IRT with the option "high flexibility"	Yes	Yes
Open IE communication		
• TCP/IP	No	No
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes

Technical specifications (continued)

Article number	6ES7148-6JA00-0AB0 ET 200eco PN: IO-Link Master	6ES7148-6JD00-0AB0 ET 200eco PN: IO-Link Master
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED
• Wire-break in actuator cable	Yes	
• Wire-break in signal transmitter cable	Yes	
• Short-circuit	Yes	Yes; Device supply to M
• Short-circuit encoder supply	Yes	
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
Potential separation		
between the load voltages	Yes	Yes
between load voltage and all other switching components	No	No
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules		No
Connection method		
Design of electrical connection		3/5-pin M12 round connectors
Dimensions		
Width	60 mm	30 mm
Height	175 mm	200 mm
Depth	49 mm	49 mm
Weights		
Weight, approx.	910 g	550 g

I/O Systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Ordering data	Article No.	Article No.
ET 200eco PN digital input modules <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	PROFINET M12 connector, for user assembly IE FC M12 PRO connector, for user assembly <ul style="list-style-type: none"> 1 unit 8 units
ET 200eco PN digital output modules <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 connecting cables Pre-assembled 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 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 8 F-DI 24 V DC/3 F-DO 24 V DC/2 A; PROFIsafe, certified up to SIL 3 (IEC 61508), PL e (ISO 13849); 4 x M12/3 x M12, degree of protection IP65/67 	6ES7147-6BG00-0AB0 6ES7146-6FF00-0AB0	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
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	M12 plug-in power cables Pre-assembled 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
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	M12 coupler plug Can be assembled, for connecting actuators or sensors, 5-pin
ET 200eco PN IO-Link master modules <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, enclosure width 60 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and port Class A as well as 8 digital inputs and 4 digital outputs 4 IO-L; 4 x M12, degree of protection IP67, enclosure width 30 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and V1.1 and port Class B 	6ES7148-6JA00-0AB0 6ES7148-6JD00-0AB0	Y cable M12 <ul style="list-style-type: none"> For double connection of I/O by means of single cable to ET 200, 5-pin For connection of single-channel sensors (1oo1 evaluation), 5-pin
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 Standard 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 Labels 10 x 7 mm, yellow, 816 units 	6ES7148-6CB00-0AAA 6ES7194-6CA00-0AAA 6ES7194-6HB00-0AAA 6ES7194-6GA00-0AAA 6ES7194-6MA00-0AAA 3RX9802-0AAA0 3RT1900-1SB10 6ES7194-6HA00-0AAA	E-coding plug for fail-safe ET 200 distributed I/Os Spare part; IP65/67, M12, 5-pin; 1 unit per packaging unit

Overview



The ET 200eco PN IO-Link master module is part of the ET 200eco PN compact block I/O range and is characterized by:

- Compact block I/O for connection to IO-Link devices and the PROFINET bus system
- Cabinet-free installation in IP67 degree of protection with M12 connection system
- Extremely rugged and resistant metal enclosure and casting
- Compact module with enclosure width of 30 mm or 60 mm
- PROFINET connection: 2 x M12 and automatic PROFINET address assignment
- Data transmission rate 100 Mbps
- 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	6ES7148-6JD00-0AB0 ET 200eco PN: IO-Link Master
Supply voltage		
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; against destruction; load increasing
Input current		
Current consumption, typ.	200 mA	100 mA
from supply voltage 1L+, max.	4 A	4 A
from load voltage 2L+, max.	4 A	4 A
Encoder supply		
Number of outputs	6	4
24 V encoder supply		
• Short-circuit protection	Yes	Yes; per channel, electronic
• Output current, max.	200 mA; 100 mA per output to X5-X6	500 mA; Per channel
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	

I/O Systems

SIMATIC ET 200 systems without control cabinet

ET 200eco PN IO-Link master

Technical specifications (continued)

Article number	6ES7148-6JA00-0AB0 ET 200eco PN: IO-Link Master	6ES7148-6JD00-0AB0 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 two outputs		
• for uprating	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	
Total current of the outputs (per group)		
all mounting positions		
- up to 60 °C, max.	3.9 A	
Cable length		
• unshielded, max.	30 m	
IO-Link		
Number of ports	4	4
• of which simultaneously controllable	4	4
IO-Link protocol 1.0	Yes	Yes
IO-Link protocol 1.1		Yes
Transmission rate	4.8 kBd (COM1); 38.4 kBd (COM2)	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Size of process data, input per port	32 byte	32 byte
Size of process data, input per module	32 byte	128 bytes + 4 bytes PQI
Size of process data, output per port	32 byte	32 byte
Size of process data, output per module	32 byte	128 byte
Memory size for device parameter		2 kbyte; for each port
Master backup		Possible with function block IO_LINK_MASTER
Configuration without S7-PCT		Possible; autostart/manual function
Cable length unshielded, max.	20 m	20 m
Operating modes		
• IO-Link	Yes	Yes
• DI	Yes	Yes
• DQ	Yes	Yes; max. 100 mA
Connection of IO-Link devices		
• Port type A	Yes	Yes; via 3-core cable
• Port type B		Yes; Additional device supply: max. 2 A per port, max. 4 A per module
• via three-wire connection	Yes	
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1

Technical specifications (continued)

Article number	6ES7148-6JA00-0AB0 ET 200eco PN: IO-Link Master	6ES7148-6JD00-0AB0 ET 200eco PN: IO-Link Master
1. Interface		
Interface types		
• integrated switch	Yes	Yes
• M12 port	Yes	Yes
Interface types		
M12 port		
• Transmission procedure	100BASE-TX	
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET CBA	No	No
PROFIsafe	No	No
PROFINET IO Device		
Services		
- IRT with the option "high flexibility"	Yes	Yes
Open IE communication		
• TCP/IP	No	No
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED
• Wire-break in actuator cable	Yes	
• Wire-break in signal transmitter cable	Yes	
• Short-circuit	Yes	Yes; Device supply to M
• Short-circuit encoder supply	Yes	
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
Potential separation		
between the load voltages	Yes	Yes
between load voltage and all other switching components	No	No
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules		No
Connection method		
Design of electrical connection		3/5-pin M12 round connectors
Dimensions		
Width	60 mm	30 mm
Height	175 mm	200 mm
Depth	49 mm	49 mm
Weights		
Weight, approx.	910 g	550 g

I/O Systems

SIMATIC ET 200 systems without control cabinet

ET 200eco PN IO-Link master

Ordering data

ET 200eco PN IO-Link master

- 4 IO-L + 8 DI + 4 DO, 24 V DC/1.3 A; 8 x M12, degree of protection IP67, enclosure width 60 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and port Class A as well as 8 digital inputs and 4 digital outputs
- 4 IO-L; 4 x M12, degree of protection IP67, enclosure width 30 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and port Class B

Accessories

- PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12
- Terminal block for ET 200eco PN, 10 A insulation-displacement connector
- 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

PROFINET M12 connector, for user assembly

IE FC M12 connector PRO, for user assembly

- 1 unit
- 8 units

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

Article No.

6ES7148-6JA00-0AB0

6ES7148-6JD00-0AB0

6ES7148-6CB00-0AA0

6ES7194-6CA00-0AA0

6ES7194-6HB00-0AA0

6ES7194-6GA00-0AA0

6ES7194-6MA00-0AA0

3RK1901-1KA00

3RT1900-1SB10

6GK1901-0DB20-6AA0

6GK1901-0DB20-6AA8

6XV1870-8AE30

6XV1870-8AE50

6XV1870-8AH10

6XV1870-8AH15

6XV1870-8AH20

6XV1870-8AH30

6XV1870-8AH50

6XV1870-8AN10

6XV1870-8AN15

Article No.

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

6XV1801-5DE30

0.5 m

6XV1801-5DE50

1.0 m

6XV1801-5DH10

1.5 m

6XV1801-5DH15

2.0 m

6XV1801-5DH20

3.0 m

6XV1801-5DH30

5.0 m

6XV1801-5DH50

10.0 m

6XV1801-5DN10

15.0 m

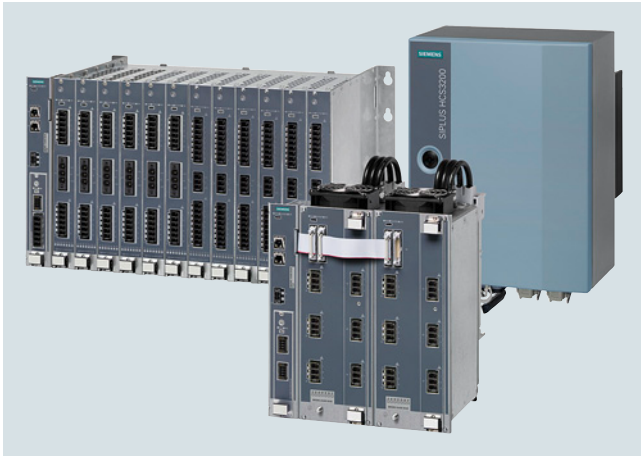
6XV1801-5DN15

Y cable M12

For double connection of I/O by means of single cable to ET 200, 5-pin

6ES7194-6KA00-0XA0

Overview



SIPLUS HCS family

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 elements 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, see <http://www.siemens.com/siplus-hcs>.

I/O Systems

IO systems for heating elements
with integrated power outputs - compact design

SIPLUS HCS3200 heating control system

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.

- HCS3200 fan: For controlling 9 emitters and 1 output for switching an external fan on/off
- HCS3200: With UL Recognized Component certification for controlling 9 emitters

Technical specifications

Article number	6BK1932-0BA00-0AA0	6BK1932-0AA00-0AA0
	SIPLUS HCS3200 Fan	SIPLUS HCS3200
General information		
Product brand name	SIPLUS	
Type of control of the heating elements	Half-wave control	
Installation type/mounting		
Mounting type	screw fixing	
Mounting position	vertical	
Type of ventilation	Self-ventilation	
Supply voltage		
Type of supply voltage	AC	
Rated value (AC)	400 V	
Relative negative tolerance	10 %	
Relative positive tolerance	10 %	
Line frequency		
• Rated value 1	50 Hz	
• Rated value 2	60 Hz	
• Relative symmetrical tolerance	5 %	
Connection method		
• Design of electrical connection for supply voltage	Connector, 4-pole + PE	Connector, 2-pole + PE
- Connectable conductor cross-sections, finely stranded with wire end processing	3x (6 ... 25 mm ²) and 1x PE (6 ... 16 mm ²)	2x (6 ... 25 mm ²) and 1x PE (6 ... 16 mm ²)
- Connectable conductor cross-sections for AWG cables	3x (8 ... 4)	2x (8 ... 4)
Input voltage		
Design of the power supply	external	
Type of voltage	DC	
Supply voltage for electronics	24 V	
Relative symmetrical tolerance of the input voltage	20 %	
Input current		
Current consumption for the electronics, max.	0.25 A	

Technical specifications (continued)

Article number	6BK1932-0BA00-0AA0 SIPLUS HCS3200 Fan	6BK1932-0AA00-0AA0 SIPLUS HCS3200
Power electronics		
Type of load	Ohmic load	
Power capacity, max.	25.2 kW	
Switching capacity current per phase, max.	63 A	
Breaking capacity maximum short-circuit current (I _{cu}) at 400 V	25 kA	
Heating power		
• Number of digital outputs	9	
• Number of heating elements per output, max.	1	
• Output voltage for heating power	400 V	
• Power carrying capacity per output, min.	200 W	
• Power carrying capacity per output, max.	4 000 W	
• Output current for heating power	10 A	
• Design of short-circuit protection per output	Fuse 16 A	Fuse 15 A
Fan control		
• Number of digital outputs	1	0
• Output voltage for fan	230 V	
• Power carrying capacity per output, min.	60 W	
• Power carrying capacity per output, max.	500 W	
• Design of short-circuit protection	Fuse 4 A	
Connection method		
• Design of electrical connection at output for heating and fan	Connector, 20-pole + PE	
- Connectable conductor cross-sections, finely stranded with wire end processing	20x (1.5 ... 4 mm ²), 1x PE (1.5 ... 16 mm ²)	18x (1.5 ... 4 mm ²), 1x PE (1.5 ... 16 mm ²)
- Connectable conductor cross-sections for AWG cables, stranded	20x (18 ... 12)	18x (18 ... 12)
Interfaces		
Interfaces/bus type	PROFIBUS DP	
PROFIBUS DP		
• Transmission rate, max.	12 Mbit/s	
• Design of electrical connection of PROFIBUS interface	ECOFAST	
Protocols		
PROFIBUS DP	Yes	
Interrupts/diagnostics/status information		
Number of status displays	2	
LED status display	LED green = status indicator, LED red = fault indicator	
Diagnostics function	Voltage diagnostics	
Diagnostic messages		
• Wire-break	Yes	
• Fuse blown	Yes	
• Load failure	Yes	
Integrated Functions		
Monitoring functions		
• Temperature monitoring	Yes	
• Type of temperature monitoring	NTC thermistor	
Measuring functions		
• Voltage measurement	Yes	
Potential separation		
Design of electrical isolation between the outputs	Optocoupler between main circuit and PELV No	

I/O Systems

IO systems for heating elements
with integrated power outputs - compact design

SIPLUS HCS3200 heating control system

Technical specifications (continued)

Article number	6BK1932-0BA00-0AA0 SIPLUS HCS3200 Fan	6BK1932-0AA00-0AA0 SIPLUS HCS3200
Isolation		
Overvoltage category	III	
Degree of pollution	2	
EMC		
EMC interference emission	in accordance with IEC 61000-6-4:2007 + A1:2011	
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge	
Field-related interference acc. 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)	
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV power supply lines / 1 kV signal lines	
Conducted interference due to surge acc. 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 cable : asymmetrical 1 kV	
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)	
Degree and class of protection		
IP degree of protection	IP65	
Standards, approvals, certificates		
Certificate of suitability	CE	CE, UL
Reference designation according to DIN EN 81346-2	Q	
Ambient conditions		
Ambient temperature during operation		
• min.	0 °C	
• max.	50 °C	
Ambient temperature during storage/transportation		
• Storage, min.	-40 °C	
• Storage, max.	70 °C	
• Transportation, min.	-40 °C	
• Transportation, max.	70 °C	
Air pressure acc. to IEC 60068-2-13		
• Operation, min.	860 hPa	
• Operation, max.	1 080 hPa	
• Storage, min.	660 hPa	
• Storage, max.	1 080 hPa	
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	
Relative humidity		
• Operation at 50 °C, max.	50 %	
Vibrations		
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.15 mm, 58 ... 150 Hz / 1 g	
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 9 Hz / 3.5 mm, 9 ... 500 Hz / 1 g	
Dimensions		
Width	300 mm	
Height	380 mm	
Depth	200 mm	

Ordering data

SIPLUS HCS3200 heating control system

SIPLUS HCS3200 UL-certified

SIPLUS HCS3200 fan, degree of protection IP65

Article No.

6BK1932-0AA00-0AA0

6BK1932-0BA00-0AA0

Article No.

Accessories

SIPLUS HCS3200 fan

as spare part

Installation kit for wall mounting

6BK1932-6AA00-0AA0

6BK1932-6BA00-0AA0

Overview

SIPLUS HCS4200 rack for 12/4 POMs

The SIPLUS HCS4200 heating control system controls and switches heat emitter arrays and other resistive loads in power supply systems in industrial environments for the voltage ranges 45 VAC, 70 VAC, 110 VAC, 230 VAC, 277 VAC, 400 VAC, and 480 VAC.

Communication takes place via PROFINET, PROFIBUS or EtherNet/IP and, in combination with SIMATIC S7, SIMOTION or an industrial PC, forms a high-performance, state-of-the-art automation system. The modular, compact and space-saving distributed I/O system can be individually adapted to suit the application.

I/O Systems

IO systems for heating elements
with integrated power outputs - modular design

SIPLUS HCS4200 heating control system > Rack

Overview



SIPLUS HCS4200 heating control system

The rack constitutes the basic mechanical structure of the SIPLUS HCS4200.

Technical specifications

Article number	6BK1942-0AA00-0AA0	6BK1942-0BA00-0AA0
	HCS Rack4200 for 12 POM	HCS Rack4200 for 4 POM
General information		
Product brand name	SIPLUS	
Installation type/mounting		
Mounting type	Control cabinet backplane	
Mounting position	Horizontal	
Type of ventilation	Self ventilation or forced ventilation	
Hardware configuration		
Type of power output connectable	POM4220	
Slots		
• Number of slots	12	4
Interfaces		
Interfaces/bus type	system interface	
Isolation		
Degree of pollution	2	
EMC		
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011	
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge	
Field-related interference acc. 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)	
Degree and class of protection		
IP degree of protection	IP20	
Standards, approvals, certificates		
Reference designation according to DIN EN 81346-2	K	

Technical specifications (continued)

Article number	6BK1942-0AA00-0AA0	6BK1942-0BA00-0AA0
	HCS Rack4200 for 12 POM	HCS Rack4200 for 4 POM
Ambient conditions		
Ambient temperature during operation		
• min.	0 °C	
• max.	55 °C	
Ambient temperature during storage/transportation		
• Storage, min.	-25 °C	
• Storage, max.	70 °C	
• Transportation, min.	-25 °C	
• Transportation, max.	70 °C	
Air pressure acc. to IEC 60068-2-13		
• Operation, min.	860 Pa	
• Operation, max.	1 080 Pa	
• Storage, min.	660 Pa	
• Storage, max.	1 080 Pa	
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	
Relative humidity		
• Operation at 25 °C, max.	95 %	
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C	
Vibrations		
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g	
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g	
Shock testing		
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis	
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis	
Dimensions		
Width	488 mm	204 mm
Height	285 mm	
Depth	293 mm	

Ordering data

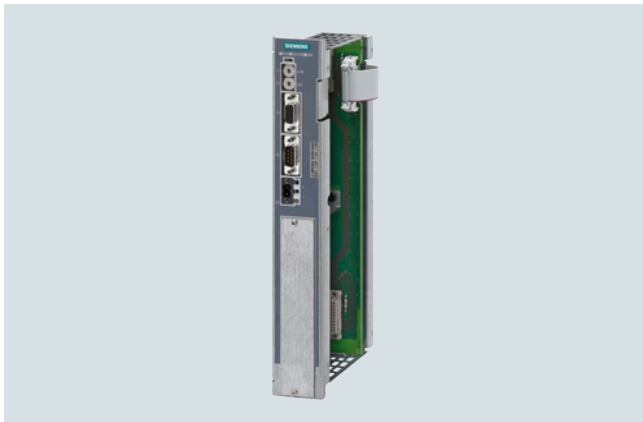
	Article No.	Article No.
SIPLUS HCS Rack 4200 for 12 POMs	6BK1942-0AA00-0AA0	
Rack for accommodating up to 12 POM4320 Power Output Modules		
SIPLUS HCS Rack 4200 for 4 POMs	6BK1942-0BA00-0AA0	
Rack for accommodating up to 4 POM4320 Power Output Modules		
Accessories		
SIPLUS HCS4200 fan module		6BK1942-4AA00-0AA0
Is attached to the top of the rack for accommodating up to 4 Power Output Modules		
Blanking cover (10 items)		6BK1942-6DA00-0AA0
For covering unoccupied slots in the rack		

I/O Systems

IO systems for heating elements
with integrated power outputs - modular design

SIPLUS HCS4200 heating control system > Central Interface Module (CIM)

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	6BK1942-1BA00-0AA0	6BK1942-1CA00-0AA0
	HCS CIM4210 PROFINET	HCS CIM4210 PROFIBUS	HCS CIM4210 EtherNet/IP
General information			
Product brand name	SIPLUS		
Installation type/mounting			
Mounting type	Screw mounting to rack		
Mounting position	vertical		
Type of ventilation	Forced ventilation		
Supply voltage			
Type of supply voltage	DC		
Rated value (DC)	24 V		
Relative negative tolerance	20 %		
Relative positive tolerance	20 %		
Connection method			
• Design of electrical connection for supply voltage	Connector 2x 2-pin with tension spring connection		
- Connectable conductor cross-sections, solid	1x (0.2 ... 2.5 mm ²)		
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.2 ... 2.5 mm ²)		
- Connectable conductor cross-sections for AWG cables	1x (26 ... 12)		
Power			
Active power input	3 W		
Hardware configuration			
Type of power output connectable	POM4220		
Slots			
• Number of slots	1		

I/O Systems

IO systems for heating elements
with integrated power outputs - modular design

SIPLUS HCS4200 heating control system > Central Interface Module (CIM)

Technical specifications (continued)

Article number	6BK1942-1AA00-0AA0 HCS CIM4210 PROFINET	6BK1942-1BA00-0AA0 HCS CIM4210 PROFIBUS	6BK1942-1CA00-0AA0 HCS CIM4210 EtherNet/IP
Interfaces			
Interfaces/bus type	PROFINET IO	PROFIBUS DP	EtherNet/IP
PROFIBUS DP			
<ul style="list-style-type: none"> Transmission rate, max. Design of electrical connection of PROFIBUS interface 		12 Mbit/s 9-pin sub D socket	
Supports protocol for PROFINET IO			
<ul style="list-style-type: none"> Transmission rate, max. Design of electrical connection of PROFINET interface 	100 Mbit/s 2x RJ45		
EtherNet/IP			
<ul style="list-style-type: none"> Transmission rate, max. Design of EtherNet/IP interface electrical connection 			100 Mbit/s 2 x RJ45
Protocols			
Supports protocol for PROFINET IO	Yes	No	
PROFIBUS DP	No	Yes	No
Further protocols			
<ul style="list-style-type: none"> EtherNet/IP 	No		Yes
Interrupts/diagnostics/ status information			
Number of status displays	3		
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display		
Isolation			
Overvoltage category	III		
Degree of pollution	2		
EMC			
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011		
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharging, 8 kV air discharging		
Field-related interference acc. 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)		
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV PROFINET cables	2 kV power supply lines / 2 kV PROFIBUS cables	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	DC supply lines: 0.5 kV symmetrical and asymmetrical, PROFIBUS lines: 1 kV asymmetrical	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)		
Degree and class of protection			
IP degree of protection	IP20		
Standards, approvals, certificates			
Reference designation according to DIN EN 81346-2	K		

I/O Systems

IO systems for heating elements
with integrated power outputs - modular design

SIPLUS HCS4200 heating control system > Central Interface Module (CIM)

Technical specifications (continued)

Article number	6BK1942-1AA00-0AA0 HCS CIM4210 PROFINET	6BK1942-1BA00-0AA0 HCS CIM4210 PROFIBUS	6BK1942-1CA00-0AA0 HCS CIM4210 EtherNet/IP
Ambient conditions			
Ambient temperature during operation			
• min.	0 °C		
• max.	55 °C		
Ambient temperature during storage/transportation			
• Storage, min.	-25 °C		
• Storage, max.	70 °C		
• Transportation, min.	-25 °C		
• Transportation, max.	70 °C		
Air pressure acc. to IEC 60068-2-13			
• Operation, min.	860 hPa		
• Operation, max.	1 080 hPa		
• Storage, min.	660 hPa		
• Storage, max.	1 080 hPa		
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m		
Relative humidity			
• Operation at 25 °C, max.	95 %		
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C		
Vibrations			
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g		
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g		
Shock testing			
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis		
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis		
Dimensions			
Width	43 mm		
Height	285 mm		
Depth	136 mm		

Ordering data

Ordering data	Article No.	Ordering data	Article No.
SIPLUS HCS4200 CIM4210 PROFINET Central Interface Module with PROFINET communication	6BK1942-1AA00-0AA0	Accessories	
SIPLUS HCS4200 CIM4210 PROFIBUS Central Interface Module with PROFIBUS communication	6BK1942-1BA00-0AA0	SIPLUS HCS4200 connector set As spare part, consisting of 20 x 2-pole connectors (24 V DC power supply)	6BK1942-6FA00-0AA0
SIPLUS HCS4200 CIM4210 EtherNet/IP Central Interface Module with EtherNet/IP	6BK1942-1CA00-0AA0	SIPLUS HCS4000 temperature I/O module For recording temperatures using temperature sensors, thermocouples and pyrometers	6BK1900-0AA00-0AA0
		SIPLUS HCS4000 DI/DO I/O module With 8 digital outputs and 8 configurable inputs/outputs	6BK1900-0BA00-0AA0
		SIPLUS HCS4000 U/I I/O module For current and voltage measurement (line voltage compensation)	6BK1900-0CA00-0AA0

Overview

The Power Output Modules (POMs) are an essential component of the SIPLUS HCS4200 heating control system. Up to 24 Power Output Modules can be operated on one Central Interface Module (CIM), split over 2 racks.

There are 5 Power Output Module versions:

- POM4220 Lowend
- POM4220 Midrange
- POM4220 Midrange Phase Control
- POM4220 Highend
- POM4220 Flexible

Technical specifications

Article number	6BK1942-2AA00-0AA0	6BK1942-2CA00-0AA0	6BK1942-2CA00-0AA1	6BK1942-2DA00-0AA0	6BK1942-2FA00-0AA0
	HCS POM4220 Lowend	HCS POM4220 Midrange	HCS POM4220 Midrange phase angle control	HCS POM4220 Highend	HCS POM4220 Flexible
General information					
Product type designation	POM4220 Lowend	POM4220 Midrange	POM4220 mid-range phase control	POM4220 High-end	POM4220 Flexible
Installation type/mounting					
Mounting type	Screw mounting to rack				
Mounting position	vertical				
Type of ventilation	Self ventilation or forced ventilation				
Supply voltage					
Type of supply voltage	AC				
Rated value (AC)	230 V				
Relative negative tolerance	10 %				
Relative positive tolerance	10 %				
2nd rated value (AC)	277 V				
Relative negative tolerance	25 %				
Relative positive tolerance	8 %				
3rd rated value (AC)	400 V				
Relative negative tolerance	10 %				
Relative positive tolerance	30 %				
4th rated value (AC)	480 V				
Relative negative tolerance	25 %				
Relative positive tolerance	8 %				
5th rated value (AC)	110 V				
Relative negative tolerance	10 %				
Relative positive tolerance	15 %				
Line frequency					
• Rated value 50 Hz	Yes				
• Rated value 60 Hz	Yes				
• Relative symmetrical tolerance	5 %				
Mains buffering					
• Recovery time after power failure, typ.	1 s				

I/O Systems

IO systems for heating elements
with integrated power outputs - modular design

SIPLUS HCS4200 heating control system > Power Output Module (POM)

Technical specifications (continued)

Article number	6BK1942-2AA00-0AA0 HCS POM4220 Lowend	6BK1942-2CA00-0AA0 HCS POM4220 Midrange	6BK1942-2CA00-0AA1 HCS POM4220 Midrange phase angle control	6BK1942-2DA00-0AA0 HCS POM4220 Highend	6BK1942-2FA00-0AA0 HCS POM4220 Flexible
Connection method	Connector, 3-pole with spring-loaded connection				
• Design of electrical connection for supply voltage	Connector, 3-pole with spring-loaded connection				
- Connectable conductor cross-sections, solid	1x (0.2 ... 10 mm ²)	1x (0.75 ... 16 mm ²)			
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 6 mm ²)	1x (0.75 ... 16 mm ²)			
- Connectable conductor cross-sections for AWG cables	1x (24 ... 8)	1x (18 ... 4)			
Input voltage	Power supply via rack				
Design of the power supply	Power supply via rack				
Power					
Active power input, max.	1 W				
Power electronics					
Type of load	Ohmic load				
Type of control of the heating elements	Half-wave control	Half-wave control and soft start	Half-wave control, phase control and soft start	Half-wave control	
Power capacity, max.	16.1 kW; At 230 V AC	23 kW; At 230 V AC		40 kW; At 400 V AC 40 kW; At 400 V AC	23 kW; At 230 V AC
• For phase against phase with fan at 40 °C, max.				12.5 kW; At 400 V AC	
• For phase against phase without fan at 40 °C, max.					
• For phase against neutral with fan at 40 °C, max.	16.1 kW; At 230 V AC	23 kW; At 230 V AC			
• For phase against neutral without fan at 40 °C, max.	7.3 kW; At 230 V AC				
Switching capacity current per phase, max.	35 A	50 A			
Short-time withstand current (SCCR) acc. to UL 508A	50 kA		100 kA		100 kA
Heating power					
• Number of digital outputs	16	12		8	12
• Number of heating elements per output, max.	1			5; Recommended, depends on tolerance of heating elements	1
• Output voltage for heating power	230 V				
• 2nd output voltage for heating power		277 V			
• 3rd output voltage for heating power				400 V	110 V
• 4th output voltage for heating power				480 V	70 V
• 5th output voltage for heating power					45 V
• Power carrying capacity per output, min.	40 W; At 230 V AC	100 W; At 230 V AC		400 W; At 230 V AC	100 W; At 230 V AC
• Power carrying capacity per output, max.	1 449 W; At 230 V AC	2 760 W; At 230 V AC	3 680 W; At 230 V AC	4 600 W; At 230 V AC	3 680 W; At 230 V AC
- for heating elements with high inrush current, max.	750 W; At 230 V AC	1 600 W; At 230 V AC		2 700 W; At 230 V AC	1 600 W; At 230 V AC
• Output current for heating power	6.3 A; max.	12 A; max.	16 A; max.	20 A; max.	16 A; max.
• Melting I2t value	57 A ² ·s	68 A ² ·s	20 A ² ·s	120 A ² ·s	20 A ² ·s
• Design of short-circuit protection per output	Safety fuse 6.3 A	Fuse 16 A		Melting fuse 25 A	Fuse 16 A
• Design of overvoltage protection	Transil Diode				

Technical specifications (continued)

Article number	6BK1942-2AA00-0AA0 HCS POM4220 Lowend	6BK1942-2CA00-0AA0 HCS POM4220 Midrange	6BK1942-2CA00-0AA1 HCS POM4220 Midrange phase angle control	6BK1942-2DA00-0AA0 HCS POM4220 Highend	6BK1942-2FA00-0AA0 HCS POM4220 Flexible
Connection method					
<ul style="list-style-type: none"> • Design of electrical connection at output for heating and fan - Connectable conductor cross-sections, solid - Connectable conductor cross-sections, finely stranded with wire end processing - Connectable conductor cross-sections for AWG cables, stranded 	Connector, 8-pin with tension spring connection 1x (0.2 ... 10 mm ²) 1x (0.25 ... 6 mm ²) 1x (24 ... 8)	Connector, 6-pole with spring-loaded connection		Plug, 4-pole, with spring-loaded connection	Connector, 6-pole with spring-loaded connection
Interfaces					
Interfaces/bus type	system interface				
Interrupts/diagnostics/status information					
Number of status displays	19	15		11	15
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display, LED red = error for each channel				
Diagnostics function	Voltage diagnostics			Voltage and current diagnosis	Voltage diagnostics
Diagnostic messages					
<ul style="list-style-type: none"> • Fuse blown • Load failure • Triac error • Switch-off threshold for internal device temperature • Parallel-connected heating elements • Rotating field fault • Communication error • Supply voltage not connected • Line voltage outside the permissible range • Frequency outside the permissible range 	Yes Yes Yes Yes No Yes Yes Yes Yes Yes			Yes No	
Integrated Functions					
Monitoring functions					
<ul style="list-style-type: none"> • Temperature monitoring • Type of temperature monitoring 	Yes NTC thermistor				
Measuring functions					
<ul style="list-style-type: none"> • Voltage measurement • Current measurement 	No No			Yes Yes	No No
Potential separation					
Design of electrical isolation between the outputs	Optocoupler and/or protective impedance between main circuit and PELV No				
Isolation					
Overvoltage category	III				
Degree of pollution	2				

I/O Systems

IO systems for heating elements
with integrated power outputs - modular design

SIPLUS HCS4200 heating control system > Power Output Module (POM)

Technical specifications (continued)

Article number	6BK1942-2AA00-0AA0 HCS POM4220 Lowend	6BK1942-2CA00-0AA0 HCS POM4220 Midrange	6BK1942-2CA00-0AA1 HCS POM4220 Midrange phase angle control	6BK1942-2DA00-0AA0 HCS POM4220 Highend	6BK1942-2FA00-0AA0 HCS POM4220 Flexible
EMC					
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011				
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge				
Field-related interference acc. 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)				
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	Supply and load lines: 1 kV symmetrical, 2 kV asymmetrical				
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)				
Degree and class of protection					
IP degree of protection	IP20				
Standards, approvals, certificates					
Reference designation according to DIN EN 81346-2	Q				
Ambient conditions					
Ambient temperature during operation					
• min.	0 °C				
• max.	55 °C				
Ambient temperature during storage/transportation					
• Storage, min.	-25 °C				
• Storage, max.	70 °C				
• Transportation, min.	-25 °C				
• Transportation, max.	70 °C				
Air pressure acc. to IEC 60068-2-13					
• Operation, min.	860 hPa				
• Operation, max.	1 080 hPa				
• Storage, min.	660 hPa				
• Storage, max.	1 080 hPa				
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	2 000 m				
Relative humidity					
• Operation at 25 °C, max.	95 %				
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C				
Vibrations					
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g				
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g				
Shock testing					
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis				
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis				
Dimensions					
Width	36 mm				
Height	285 mm				
Depth	281 mm				

SIPLUS HCS4200 heating control system > Power Output Module (POM)

Ordering data	Article No.	Ordering data	Article No.
SIPLUS HCS4200 POM4220 Lowend Power Output Module with 16 outputs for connecting resistive loads	6BK1942-2AA00-0AA0	Accessories	
SIPLUS HCS4200 POM4220 Midrange Power Output Module with 12 outputs for connecting resistive loads	6BK1942-2CA00-0AA0	Spare fuse, 6.3 A/250 V, for the POM4220 Lowend	6BK1942-6AA00-0AA0
SIPLUS HCS4200 POM4220 Midrange phase control Power Output Module with 12 outputs for connecting resistive loads	6BK1942-2CA00-0AA1	Spare fuse, 16 A/500 V, for the POM4220 Midrange	6BK1942-6BA00-0AA0
SIPLUS HCS4200 POM4220 Highend Power Output Module with 8 outputs for connecting resistive loads	6BK1942-2DA00-0AA0	Spare fuse, 16 A/500 V, for the POM4220 Midrange	6BK1942-6HA00-0AA0
SIPLUS HCS4200 POM4220 Flexible Power Output Module with 12 outputs for connecting resistive loads	6BK1942-2FA00-0AA0	Spare fuse, 25 A/600 V, for the POM4220 Highend	6BK1942-6KA00-0AA0
		SIPLUS HCS4200 connector set as accessory comprising 10 connectors, 3-pin, for incoming supply, POM4220 Lowend	6BK1943-6AA00-0AA0
		SIPLUS HCS4200 connector set as accessory comprising 5 connectors, 8-pin, for power outputs, POM4220 Lowend	6BK1942-6CA00-0AA0
		SIPLUS HCS4200 connector set as accessory comprising 6 connectors, 3-pin, for incoming supply, POM4220 Midrange	6BK1942-6KA00-0AA0
		SIPLUS HCS4200 connector set as accessory comprising 5 connectors, 6-pin, for power outputs, POM4220 Midrange	6BK1942-6EA00-0AA0
		SIPLUS HCS4200 connector set as accessory comprising 5 connectors, 4-pin, for power outputs, POM4220 Highend	6BK1942-6LA00-0AA0

I/O Systems

IO systems for heating elements
with integrated power outputs - modular design

SIPLUS HCS4300 heating control system

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 or PROFIBUS and can be used together with SIMATIC S7, for example, to form a highly modern and powerful automation system.

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	6BK1943-1BA00-0AA0	6BK1943-1CA00-0AA0
	HCS CIM4310 PROFINET	HCS CIM4310 PROFIBUS	HCS CIM4310 EtherNet/IP
General information			
Product brand name	SIPLUS		
Installation type/mounting			
Mounting type	Screw mounting to POM		
Mounting position	vertical		
Type of ventilation	Forced ventilation		
Supply voltage			
Type of supply voltage	DC		
Rated value (DC)	24 V		
Relative negative tolerance	20 %		
Relative positive tolerance	20 %		
Connection method			
• Design of electrical connection for supply voltage	Connector 2x 2-pin with tension spring connection		
- Connectable conductor cross-sections, solid	1x (0.2 ... 2.5 mm ²)		
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.2 ... 2.5 mm ²)		
- Connectable conductor cross-sections for AWG cables	1x (26 ... 12)		
Power			
Active power input	3 W		
Hardware configuration			
Type of power output connectable	POM4320		
Slots			
• Number of slots	1		

I/O Systems

IO systems for heating elements
with integrated power outputs - modular design

SIPLUS HCS4300 heating control system > Central interface module (CIM)

Technical specifications (continued)

Article number	6BK1943-1AA00-0AA0 HCS CIM4310 PROFINET	6BK1943-1BA00-0AA0 HCS CIM4310 PROFIBUS	6BK1943-1CA00-0AA0 HCS CIM4310 EtherNet/IP
Interfaces			
Interfaces/bus type	PROFINET IO	PROFIBUS DP	EtherNet/IP
PROFIBUS DP			
<ul style="list-style-type: none"> Transmission rate, max. Design of electrical connection of PROFIBUS interface 		12 Mbit/s 9-pin sub D socket	
Supports protocol for PROFINET IO			
<ul style="list-style-type: none"> Transmission rate, max. Design of electrical connection of PROFINET interface 	100 Mbit/s 2 x RJ45		
EtherNet/IP			
<ul style="list-style-type: none"> Transmission rate, max. Design of EtherNet/IP interface electrical connection 			100 Mbit/s 2 x RJ45
Protocols			
Supports protocol for PROFINET IO	Yes	No	
PROFIBUS DP	No	Yes	No
Further protocols			
<ul style="list-style-type: none"> EtherNet/IP 	No		Yes
Interrupts/diagnostics/ status information			
Number of status displays	3		
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display		
Isolation			
Overvoltage category	III		
Degree of pollution	2		
EMC			
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011		
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge		
Field-related interference acc. 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)		
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV PROFINET cables	2 kV power supply lines / 2 kV PROFIBUS cables	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	DC supply lines: 0.5 kV symmetrical and asymmetrical, PROFIBUS lines: 1 kV asymmetrical	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)		
Degree and class of protection			
IP degree of protection	IP20		
Standards, approvals, certificates			
Reference designation according to DIN EN 81346-2	K		
Ambient conditions			
Ambient temperature during operation			
<ul style="list-style-type: none"> min. max. 	0 °C 55 °C		
Ambient temperature during storage/transportation			
<ul style="list-style-type: none"> Storage, min. Storage, max. Transportation, min. Transportation, max. 	-25 °C 70 °C -25 °C 70 °C		

Technical specifications (continued)

Article number	6BK1943-1AA00-0AA0 HCS CIM4310 PROFINET	6BK1943-1BA00-0AA0 HCS CIM4310 PROFIBUS	6BK1943-1CA00-0AA0 HCS CIM4310 EtherNet/IP
Air pressure acc. to IEC 60068-2-13			
• Operation, min.	860 hPa		
• Operation, max.	1 080 hPa		
• Storage, min.	660 hPa		
• Storage, max.	1 080 hPa		
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m		
Relative humidity			
• Operation at 25 °C, max.	95 %		
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C		
Vibrations			
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g		
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g		
Shock testing			
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis		
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis		
Dimensions			
Width	56 mm		
Height	285 mm		
Depth	136 mm		

Ordering data
SIPLUS HCS4300 CIM4310

Central Interface Module with PROFINET communication

Central Interface Module with PROFIBUS communication

Central Interface module with EtherNet/IP

Article No.
6BK1943-1AA00-0AA0
6BK1943-1BA00-0AA0
6BK1943-1CA00-0AA0
Article No.
Accessories
SIPLUS HCS4300 EM4315

Expansion module for SIPLUS HCS4300, extends the configuration with 8 power output modules

SIPLUS HCS4000 I/O module temperature

For recording temperatures using temperature sensors, thermocouples and pyrometers

SIPLUS HCS4000 I/O module DI/DO

With 8 digital outputs and 8 configurable inputs/outputs

SIPLUS HCS4000 I/O module U/I

For current and voltage measurement (line voltage compensation)

6BK1943-1AA50-0AA0
6BK1900-0AA00-0AA0
6BK1900-0BA00-0AA0
6BK1900-0CA00-0AA0

I/O Systems

IO systems for heating elements
with integrated power outputs - modular design

SIPLUS HCS4300 heating control system > Power Output Module (POM)

Design



- Module (encapsulated) in a metal enclosure
- 9 outputs for connecting resistive loads
- There are four versions:
 - POM4320 busbar mounting (IEC):
a current of up to 16 A can be used per output
 - POM4320 busbar mounting (UL):
a current of up to 15 A can be used per output
 - POM4320 rear panel mounting (IEC):
a current of up to 16 A can be used per output
 - POM4320 rear panel mounting (UL):
a current of up to 15 A can be used per output
- Connection of the phases via rear busbar adapter or connecting terminals
- Two-pole connection of heat emitters using mating connectors (mating connectors are included in the scope of supply!)
- Two fuses per output for supply and return line in a fuse module which can be plugged on and pulled off
- Heat dissipation by fan fitted to top of module
- Internal serial interface
- Three diagnostics LEDs for displaying module faults
- Nine diagnostics LEDs for displaying output errors

Technical specifications

Article number	6BK1943-2AA00-0AA0	6BK1943-2AA00-0AA2	6BK1943-2BA00-0AA0	6BK1943-2BA00-0AA2	6BK1943-2CA00-0AA0	6BK1943-2CA00-0AA2	6BK1943-2DA00-0AA0	6BK1943-2DA00-0AA2
	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (UL)	HCS POM4320 busbar mounting (UL)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (UL)	HCS POM4320 panel mounting (UL)
General information								
Product type designation	POM4320							
Installation type/mounting								
Mounting type	Busbar mounting				Panel mounting			
Mounting position	vertical							
Type of ventilation	Self-ventilation							
Supply voltage								
Type of supply voltage	AC							
Rated value (AC)	400 V							
Relative negative tolerance	10 %							
Relative positive tolerance	30 %							
2nd rated value (AC)	480 V							
Relative negative tolerance	25 %							
Relative positive tolerance	8 %							
Line frequency								
• Rated value 50 Hz	Yes							
• Rated value 60 Hz	Yes							
• Relative symmetrical tolerance	5 %							
Mains buffering								
• Recovery time after power failure, typ.	1 s							

Technical specifications (continued)

Article number	6BK1943-2AA00-0AA0	6BK1943-2AA00-0AA2	6BK1943-2BA00-0AA0	6BK1943-2BA00-0AA2	6BK1943-2CA00-0AA0	6BK1943-2CA00-0AA2	6BK1943-2DA00-0AA0	6BK1943-2DA00-0AA2
	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (UL)	HCS POM4320 busbar mounting (UL)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (UL)	HCS POM4320 panel mounting (UL)
Connection method								
• Design of electrical connection for supply voltage	Busbar mounting, 3-pole + PE				Terminal, 3-pin			
- Connectable conductor cross-sections, solid					1x (1.5 ... 50 mm ²)			
- Connectable conductor cross-sections, finely stranded with wire end processing					1x (1.5 ... 35 mm ²)			
- Connectable conductor cross-sections for AWG cables					1x (16 ... 1)			
Input voltage								
Design of the power supply	Power supply via CIM							
Power								
Active power input, max.	8 W							
Power electronics								
Type of load	Ohmic load							
Type of control of the heating elements	Half-wave control and soft start	Half-wave control, phase control and soft start	Half-wave control and soft start	Half-wave control, phase control and soft start	Half-wave control and soft start	Half-wave control, phase control and soft start	Half-wave control and soft start	Half-wave control, phase control and soft start
Power capacity, max.	57.6 kW; At 400 V AC		51.8 kW; At 480 V AC	64.8 kW; At 480 V AC	57.6 kW; At 400 V AC		51.8 kW; At 480 V AC	64.8 kW; At 480 V AC
• For phase against phase with fan at 40 °C, max.	57.6 kW; At 400 V AC		51.8 kW; At 480 V AC	64.8 kW; At 480 V AC	57.6 kW; At 400 V AC		51.8 kW; At 480 V AC	64.8 kW; At 480 V AC
Switching capacity current per phase, max.	83 A		63 A	80 A	83 A		63 A	80 A
Short-time withstand current (SCCR) acc. to UL 508A			50 kA	100 kA			50 kA	100 kA
Heating power								
• Number of digital outputs	9							
• Number of heating elements per output, max.	1							
• Output voltage for heating power	400 V							
• 2nd output voltage for heating power	480 V							
• Power carrying capacity per output, min.	200 W; At 400 V AC		200 W; At 480 V AC		200 W; At 400 V AC		200 W; At 480 V AC	
• Power carrying capacity per output, max.	6 400 W; At 400 V AC		5 760 W; At 480 V AC	7 200 W; At 480 V AC	6 400 W; At 400 V AC		5 760 W; At 480 V AC	7 200 W; At 480 V AC
- for heating elements with high inrush current, max.	4 000 W; At 400 V AC		3 000 W; At 480 V AC	4 000 W; At 480 V AC	4 000 W; At 400 V AC		3 000 W; At 480 V AC	4 000 W; At 480 V AC
• Output current for heating power	16 A; max.		12 A; max.	15 A; max.	16 A; max.		12 A; max.	15 A; max.
• Melting I ² t value	250 A ² ·s		225 A ² ·s	400 A ² ·s	250 A ² ·s		225 A ² ·s	400 A ² ·s
• Design of short-circuit protection per output	Fuse 16 A		Fuse 15 A	Melting fuse 20 A	Fuse 16 A		Fuse 15 A	Melting fuse 20 A
• Design of overvoltage protection	Transil Diode							
Connection method								
• Design of electrical connection at output for heating and fan	Connector, 3-pole with spring-loaded connection							
- Connectable conductor cross-sections, solid	1x (0.2 ... 10 mm ²)							
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 6 mm ²)							
- Connectable conductor cross-sections for AWG cables, stranded	1x (24 ... 8)							

I/O Systems

IO systems for heating elements
with integrated power outputs - modular design

SIPLUS HCS4300 heating control system > Power Output Module (POM)

Technical specifications (continued)

Article number	6BK1943-2AA00-0AA0	6BK1943-2AA00-0AA2	6BK1943-2BA00-0AA0	6BK1943-2BA00-0AA2	6BK1943-2CA00-0AA0	6BK1943-2CA00-0AA2	6BK1943-2DA00-0AA0	6BK1943-2DA00-0AA2
	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (UL)	HCS POM4320 busbar mounting (UL)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (UL)	HCS POM4320 panel mounting (UL)
Interfaces								
Interfaces/bus type	system interface							
Interrupts/diagnostics/ status information								
Number of status displays	12							
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display, LED red = error for each channel							
Diagnostics function	Voltage diagnostics							
Diagnostic messages								
• Fuse blown	Yes							
• Load failure	Yes							
• Triac error	Yes							
• Switch-off threshold for internal device temperature	Yes							
• Parallel-connected heating elements	No							
• Rotating field fault	Yes							
• Communication error	Yes							
• Supply voltage not connected	Yes							
• Line voltage outside the permissible range	Yes							
• Frequency outside the permissible range	Yes							
Integrated Functions								
Monitoring functions								
• Temperature monitoring	Yes							
• Type of temperature monitoring	NTC thermistor							
Measuring functions								
• Voltage measurement	Yes							
• Current measurement	No							
Potential separation								
Design of electrical isolation between the outputs	Optocoupler and/or protective impedance between main circuit and PELV No							
Isolation								
Overtoltage category	III							
Degree of pollution	2							
EMC								
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011							
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge							
Field-related interference acc. 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)							
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)							
Degree and class of protection								
IP degree of protection	IP20							
Standards, approvals, certificates								
Reference designation according to DIN EN 81346-2	Q							

Technical specifications (continued)

Article number	6BK1943-2AA00-0AA0	6BK1943-2AA00-0AA2	6BK1943-2BA00-0AA0	6BK1943-2BA00-0AA2	6BK1943-2CA00-0AA0	6BK1943-2CA00-0AA2	6BK1943-2DA00-0AA0	6BK1943-2DA00-0AA2
	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (UL)	HCS POM4320 busbar mounting (UL)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (UL)	HCS POM4320 panel mounting (UL)
Ambient conditions								
Ambient temperature during operation								
• min.	0 °C							
• max.	55 °C							
Ambient temperature during storage/transportation								
• Storage, min.	-25 °C							
• Storage, max.	70 °C							
• Transportation, min.	-25 °C							
• Transportation, max.	70 °C							
Air pressure acc. to IEC 60068-2-13								
• Operation, min.	860 hPa							
• Operation, max.	1 080 hPa							
• Storage, min.	660 hPa							
• Storage, max.	1 080 hPa							
Altitude during operation relating to sea level								
• Installation altitude above sea level, max.	2 000 m							
Relative humidity								
• Operation at 25 °C, max.	95 %							
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C							
Vibrations								
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g							
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g							
Shock testing								
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis							
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis							
Dimensions								
Width	104 mm							
Height	340 mm				344 mm			
Depth	250 mm				217 mm			

Ordering data

SIPLUS HCS4300 POM4320

Power output module with 9 outputs for connecting resistive loads

IEC, busbar mounting

6BK1943-2AA00-0AA0

IEC, busbar mounting, redesign version with enhanced interference immunity

6BK1943-2AA00-0AA2

UL, busbar mounting

6BK1943-2BA00-0AA0

UL, busbar mounting, redesign version with enhanced interference immunity and 100 kA SCCR

6BK1943-2BA00-0AA2

IEC, rear panel mounting

6BK1943-2CA00-0AA0

IEC, rear panel mounting, redesign version with enhanced interference immunity

6BK1943-2CA00-0AA2

UL, rear panel mounting

6BK1943-2DA00-0AA0

UL, rear panel mounting, redesign version with enhanced interference immunity and 100 kA SCCR

6BK1943-2DA00-0AA2

Accessories

SIPLUS HCS4300 connecting cable from POM to POM

- Consisting of 10 items, 10 cm long
- Consisting of 10 items, 25 cm long

6BK1943-5AA00-0AA0

6BK1943-5BA00-0AA0

SIPLUS HCS4300 connector set

- Consisting of 10 x 3-pole connectors

6BK1943-6AA00-0AA0

Spare fuse, 16 A/500 V, for POM4320

6BK1943-6BA00-0AA0

Fan as spare part

6BK1700-2GA00-0AA0

I/O Systems

PROFIBUS components

Power Rail Booster

Overview



- The device for low-cost PROFIBUS DP transfer over contact conductors and slip rings in IP20 degree of protection
- Permissible baud rates from 9600 bps to 500 kbps, self-optimizing
- Permissible busbar length: from 25 m at 500 kbps to 1200 m at 9600 bps
- 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 Kbps, 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 Kbps

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
- PROFIBUS DP standard slaves (DP-V1)
- Automatic determination of fault types and locations
- Data transmission rate 9.6 kbps to 12 Mbps
- Connection via FastConnect using IDC

Technical specifications

Article number	6ES7972-0AB01-0XA0
	Diagnostic repeater f. PROFIBUS-DP,
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at 25 °C

Article number	6ES7972-0AB01-0XA0
	Diagnostic repeater f. PROFIBUS-DP,
Connection method	
Design of electrical connection for supply voltage	Terminal block
Design of electrical connection for PROFIBUS cables	FastConnect insulation displacement, 10 clamping cycles possible
Dimensions	
Width	80 mm
Height	125 mm
Depth	67.5 mm
Weights	
Weight, approx.	300 g

I/O Systems

PROFIBUS components

Diagnostics

Diagnostic 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 lines	6ES7972-0AB01-0XA0	PROFIBUS FastConnect stripping tool Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	6GK1905-6AA00
Accessories		PROFIBUS FC standard cable Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	6XV1830-0EH10
RS 485 bus connector with 90° cable outlet With screw terminals, max. transfer rate 12 Mbps • Without PG interface • With PG interface	6ES7972-0BA12-0XA0 6ES7972-0BB12-0XA0	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
PROFIBUS FastConnect bus connector RS 485 with 90° cable outlet With insulation displacement terminals, max. transfer rate 12 Mbps Without PG interface • 1 unit • 100 units With PG interface • 1 unit • 100 units Without PG interface, grounding via control cabinet cover • 1 unit With PG interface, grounding via control cabinet cover • 1 unit	6ES7972-0BA52-0XA0 6ES7972-0BA52-0XB0 6ES7972-0BB52-0XA0 6ES7972-0BB52-0XB0 6ES7972-0BA70-0XA0 6ES7972-0BB70-0XA0	S7 Manual Collection update service for 1 year Scope of supply: Current DVD "S7 Manual Collection" and the three subsequent updates	6ES7998-8XC01-8YE2
RS 485 bus connector with angled cable outlet (35°) With screw terminals, max. transfer rate 12 Mbps • Without PG interface • With PG interface	6ES7972-0BA42-0XA0 6ES7972-0BB42-0XA0	Connecting cable for PROFIBUS 12 Mbps, for PG connection to PROFIBUS DP, pre-assembled with 2 x 9-pin sub D plug, 3.0 m	6ES7901-4BD00-0XA0
PROFIBUS FastConnect RS 485 bus connector with angular cable outlet (35°) With insulation displacement terminals, max. transfer rate 12 Mbps • Without PG interface • With PG interface	6ES7972-0BA61-0XA0 6ES7972-0BB61-0XA0		

SIPLUS diagnostic 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 kbps to 12 Mbps
- 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.

For technical documentation on SIPLUS, see:

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

Technical specifications

Article number	6AG1972-0AB01-4XA0
Based on	6ES7972-0AB01-0XA0 SIPLUS diagnostic repeater for PROFIBUS
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C; = Tmin (incl. condensation/frost)
• max.	60 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	6AG1972-0AB01-4XA0
Based on	6ES7972-0AB01-0XA0 SIPLUS diagnostic repeater for PROFIBUS
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O Systems

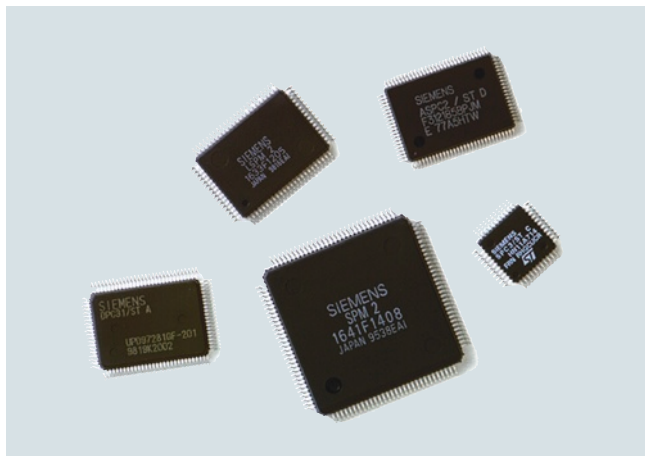
PROFIBUS components

Diagnostics

SIPLUS diagnostic repeater for PROFIBUS

Ordering data	Article No.		Article No.
<p>SIPLUS RS 485 diagnostics repeater</p> <p>To connect up to 2 segments to PROFIBUS DP, with online diagnostics functions for monitoring the bus lines</p> <p>Exposure to media</p>	<p>6AG1972-0AB01-4XA0</p>	<p>Accessories</p> <p>RS 485 bus connector with 90° cable outlet</p> <p>Max. transfer rate 12 Mbps</p> <p>Extended temperature range and exposure to media</p> <ul style="list-style-type: none"> • without PG interface • with PG interface <p>RS 485 bus connector with angled cable outlet</p> <p>(Extended temperature range -40 °C ... +70 °C and exposure to media)</p> <p>Max. transfer rate 12 Mbps</p> <ul style="list-style-type: none"> • without PG interface • with PG interface <p>Additional accessories</p>	<p style="text-align: center; vertical-align: middle;"> 6AG1972-0BA12-2XA0 6AG1972-0BB12-2XA0 </p> <hr/> <p style="text-align: center; vertical-align: middle;"> 6AG1972-0BA42-7XA0 6AG1972-0BB42-7XA0 </p> <hr/> <p>See SIMATIC RS 485 diagnostics repeater, page 9/416</p>

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 Mbps	12 Mbps	12 Mbps	12 Mbps
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 Mbps	12 Mbps	31.25 Kbps	12 Mbps
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

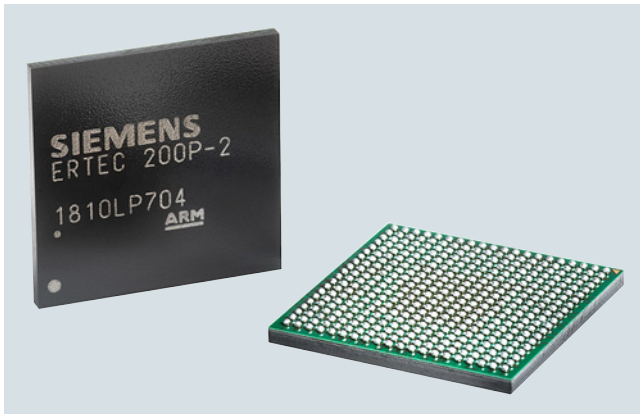
I/O Systems

PROFIBUS components

PROFIBUS DP ASICs

Ordering data	Article No.	Ordering data	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) (tape & reel) 	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 kbps <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) (tape & reel) 	6ES7195-0BG00-0XA0 6ES7195-0BG10-0XA0 6ES7195-0BG20-0XA0 6ES7195-0BG30-0XA0 6ES7195-0BG40-0XA0	Accessories 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
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 DPC 31 <ul style="list-style-type: none"> • DPV1 firmware 	6ES7195-2BB00-0XA0

Overview

Innovative and well-proven

As a dedicated PI member, Siemens has been actively advancing the development of PROFINET from the beginning. Siemens technology components benefit from the accumulated know-how. They have been field-proven in countless products, provide maximum performance capability and can be scaled to exact requirements.

And that is not all. Siemens Competence Centers offer advice for choosing the right technology component for the device, training opportunities and support throughout the development process, up to and including successful certification.

ERTEC 200P-2 – Your path to the fastest PROFINET

The ERTEC 200P-2 (Enhanced Real-Time Controller) sets new standards for communication.

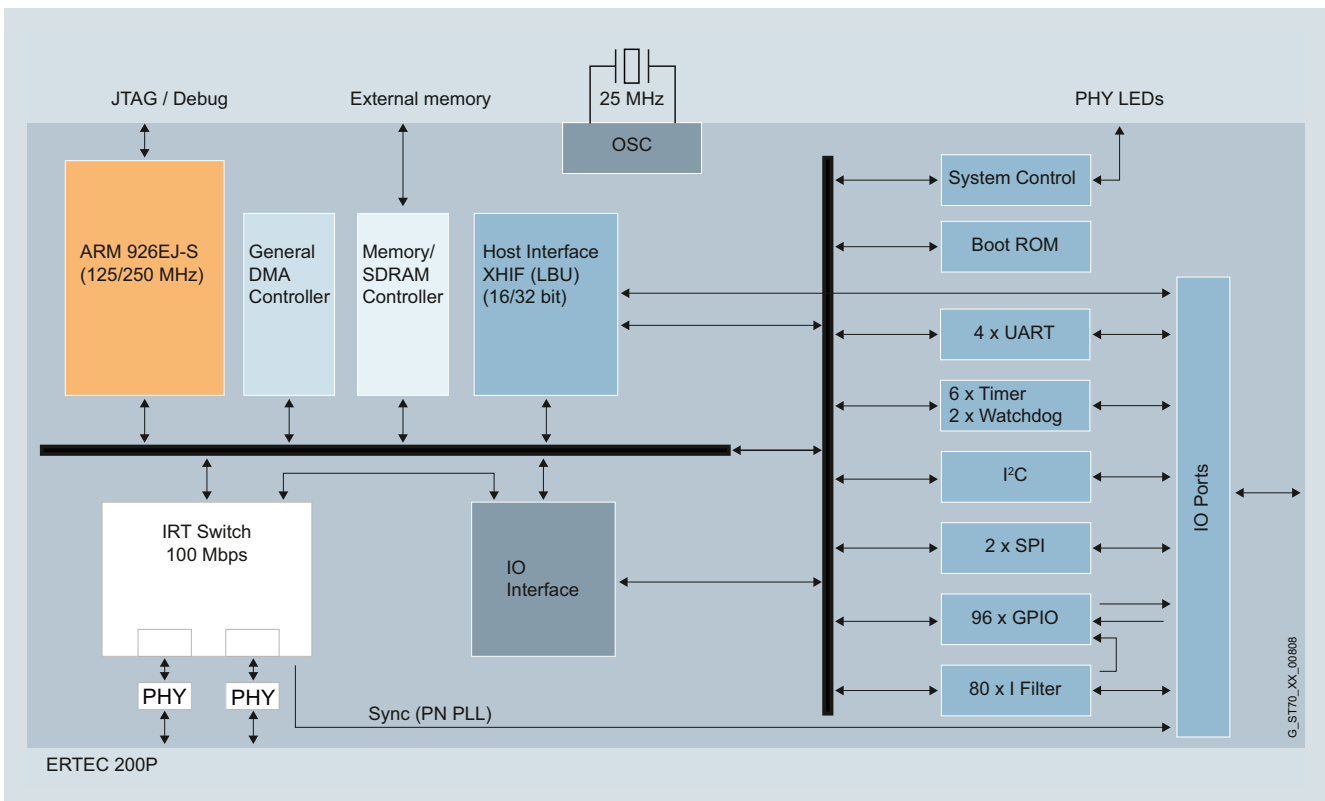
Designed for cycle times as low as 125 μ s, the performance upgrade for PROFINET has been integrated in the ERTEC 200P-2. With its 250 MHz ARM9 CPU and integrated IRT (isochronous real-time) switch, field devices with demanding performance requirements can be implemented. The reduced chip size simplifies integration into compact field devices. The CPU also allows integration of a user's own applications, which makes an external host CPU unnecessary depending on the application.

Development kit for ERTEC 200P-2

The development kit includes an evaluation board with sample applications so that commissioning can be completed in minimum time. The PROFINET stack is delivered as source code and includes the eCos open source real-time operating system and all development tools, analysis programs and documentation. Field devices with RT (real-time) and IRT (isochronous real-time) can be implemented with the ERTEC ASICs. The integrated switch allows the construction of field devices with two ports.

Functions:

- Isochronous mode
- Shared device for 4 controllers
- S2 system redundancy
- PROFINET performance upgrade with a minimum cycle time of 125 μ s.
- MRP/MRPD
- Regular, no-cost updates
- Current technology certificate



Internal structure of ERTEC 200P-2

I/O Systems

PROFINET components

Enhanced Real-Time Ethernet Controller ERTEC**Technical specifications**

	ERTEC 200P-2
Integrated IRT switch	2-port
Integrated PHYs	Yes
Copper and fiber-optic cable supported	Yes
Minimum cycle time	125 µs
ARM CPU	ARM 926
Clock frequency	250 MHz
Configurable IOs, general purpose IOs	96
Enclosure size	17x17 mm
Ball pitch	0.8 mm

Ordering data**Article No.****ERTEC 200P-2**

ASIC for connection to switched Ethernet 100 Mbps, Ethernet controller with integrated 2-port switch, ARM 926 processor and integrated PHYs; recommended for new developments

- 10 units (evaluation pack)
- 90 units (single tray)
- 450 units (drypack, 5 trays)
- 1 000 units (tape & reel)

6ES7195-0BH02-0XA0
6ES7195-0BH12-0XA0
6ES7195-0BH22-0XA0
6ES7195-0BH32-0XA0

EK-ERTEC 200P PN IO evaluation kit with ERTEC 200P-2

6ES7195-3BE00-0YA0

ERTEC 200P

ASIC for connection to Switched Ethernet 100 Mbps, 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)
- 1 000 units (tape & reel)

6ES7195-0BH00-0XA0
6ES7195-0BH10-0XA0
6ES7195-0BH20-0XA0
6ES7195-0BH30-0XA0

ERTEC 200

ASIC ERTEC 200 for connection to Switched Ethernet 10/100 Mbps, 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)
- 1050 units (tape & reel)

6GK1182-0BB01-0AA1
6GK1182-0BB01-0AA2
6GK1182-0BB01-0AA3
6GK1182-0BB01-0AA4

ERTEC 400

ASIC ERTEC 400 for connection to Switched Ethernet 10/100 Mbps, 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

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 PROFI-safe starter kit permits the implementation of fail-safe devices. In so doing, the PROFI-safe stack applicatively builds on the PROFINET stack.

Ordering data

Article No.

ERTEC development kits / evaluation kits

EK-ERTEC 200P PN IO evaluation kit for ERTEC 200P-2

6ES7195-3BE00-0YA0

Development kit for standard Ethernet controllers

6ES7195-3BC00-0YA0

PROFI-safe starter kit V3.5 according to the PROFI-safe V2.6.1 profile

6ES7195-3BF03-0YA0

ERTEC ASICs**ERTEC 200P-2**

ASIC for connection to Switched Ethernet 100 Mbps, 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)
- 1 000 units (tape & reel)

6ES7195-0BH02-0XA0

6ES7195-0BH12-0XA0

6ES7195-0BH22-0XA0

6ES7195-0BH32-0XA0

Accessories

PROFINET IO product line license for one product line

6ES7195-3BC10-0YA0

I/O Systems

PROFINET components

PROFINET drivers

Overview

PROFINET driver for controllers

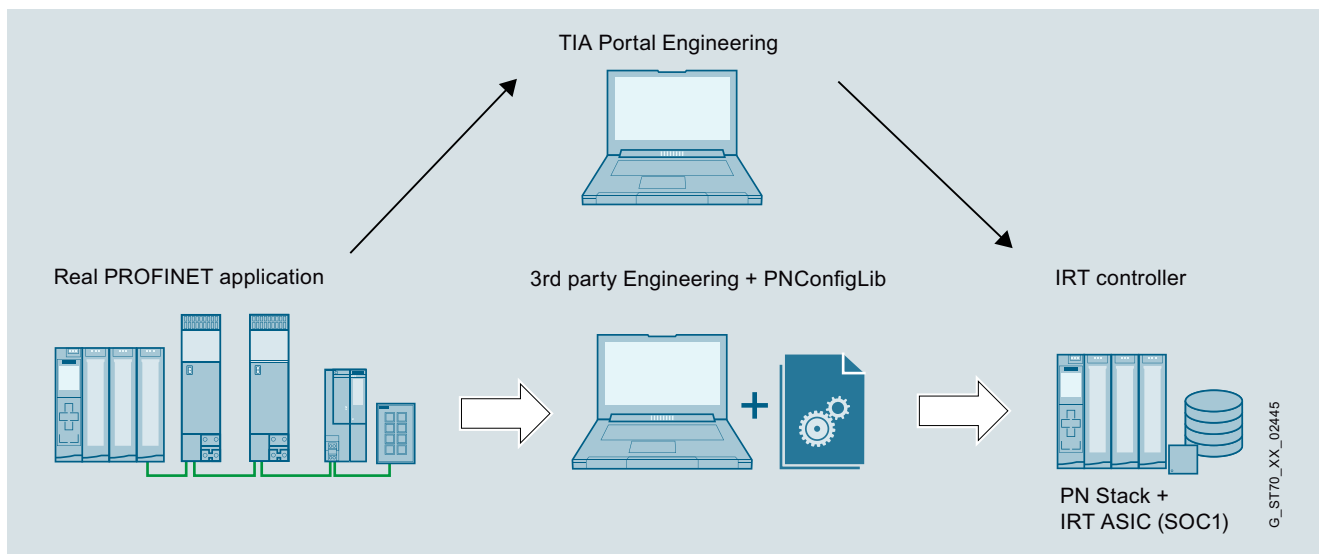
Reasonably priced components are a major competitive advantage, especially in series machine building. Here, users often develop in-house control software. For reasons of performance, flexibility and cost, the individual application is then implemented on standard PCs. The PROFINET driver supports this in-house development and requires no special hardware thanks to its conventional Ethernet interface.

Because the PROFINET driver is delivered as source code, proprietary solutions can be ported into various operating systems and hardware platforms. As a result, the PROFINET driver can also be optimally used in embedded systems for in-house controller solutions. Design and configuration is easy and takes place via an open XML interface without the need for engineering tools. The well-proven PROFINET stack from SIMATIC forms the centerpiece.

The PROFINET driver is suitable for both simple applications, such as individual PROFINET lines, as well as for complex machines. It supports PROFINET RT for cycle times starting from 1 ms via a standard Ethernet interface. Alternatively, PROFINET IRT can also be used for cycle times starting from 500 µs, in connection with the CP1625 controller development kit.

PROFINET ConfigLib

PROFINET networks must be planned. This can be carried out for the PROFINET driver using the TIA Portal. A license is not required. ConfigLib is a standalone API for generating PROFINET hardware configurations. It can be used to create RT and IRT projects, whereby ConfigLib takes over the planning algorithm.



PNConfigLib – Efficient creation of hardware configurations without the TIA Portal

CP1625 Controller Development Kit

Siemens SOC1 gives you the hardware support required to build an IRT controller. The CP1625 Controller Development Kit is suitable for both standalone and host modes.

- Stand-alone mode: PN stack and application run on the CP1625
- Host mode: Application runs on the PC or, for example, ARM. The stack runs on the CP1625



SIMATIC CP1625

Ordering data**Article No.****PROFINET Driver V2.1**

For connecting distributed I/O and drives to user-specific control applications via PROFINET

PN Driver V2.1 development license and PN ConfigLib

6ES7195-3AA00-0YA0

SIMATIC CP1625 Development Board; PCIe card for PROFINET IRT

6ES7648-2CF10-1BA0

Runtime licenses

- 1 unit
- 10 units
- 50 units
- 200 units
- 500 units

6ES7195-3AA05-0XA0**6ES7195-3AA10-0XA0****6ES7195-3AA20-0XA0****6ES7195-3AA30-0XA0****6ES7195-3AA40-0XA0**

I/O Systems

Network components for PROFIBUS
Electrical networks (RS 485)

Active RS 485 terminating element

Overview



- Terminates bus segments at data transmission rates of 9.6 Kbps to 12 Mbps
- Power supply independent of bus stations.

Designed for Industry

- Terminal-independent bus termination through onboard power supply

Technical specifications

Article number	6ES7972-0DA00-0AA0 RS485 Termin. resistor f. PROFIBUS/MPI,
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, typ.	30 mA
Power loss	
Power loss, max.	0.72 W
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at +25 °C
Connection method	
Design of electrical connection for supply voltage	Screw terminal block
Design of electrical connection for PROFIBUS cables	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

6ES7972-0DA00-0AA0

For terminating bus segments at transmission rates of 9.6 kbps to 12 Mbps

Overview



- Automatic detection of transmission rates
- Transmission rates from 9.6 kbps to 12 Mbps are possible, incl. 45.45 kbps
- 24 V DC voltage display
- Indication of segment 1 and 2 bus activity
- 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
- Galvanic 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 9/415.

Technical specifications

Article number	6ES7972-0AA02-0XA0 Repeater RS 485 f. PROFIBUS/MPI
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
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)
Power loss	
Power loss, typ.	0.7 W
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at 25 °C
Connection method	
Design of electrical connection for supply voltage	Terminal block
Design of electrical connection for PROFIBUS cables	2 terminal blocks
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 Mbps,
24 V DC, IP20 enclosure

I/O Systems

Network components for PROFIBUS
Electrical networks (RS 485)

SIPLUS DP active RS 485 terminating element

Overview



- Used to terminate bus segments at rates of 9.6 kbps to 12 Mbps
- Power supply independent of the bus participants

Designed for Industry

- End-device independent bus termination thanks 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.

For technical documentation on SIPLUS, see:

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

Article number	6AG1972-0DA00-2AA0
Based on	6ES7972-0DA00-0AA0 SIPLUS Profibus Terminator
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Technical specifications

Article number	6AG1972-0DA00-2AA0
Based on	6ES7972-0DA00-0AA0 SIPLUS Profibus Terminator
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin (incl. condensation/frost)
• max.	60 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Ordering data

SIPLUS active RS 485 terminating element for PROFIBUS

To terminate bus segments at transmission rates of 9.6 kbps to 12 Mbps

Extended temperature range and exposure to media

Article No.

6AG1972-0DA00-2AA0

Overview



- Automatically detects transmission rate
- 45.45 kbps transmission rate is possible
- 24 V DC voltage display
- Indication of segment 1 and 2 bus activity
- 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 number of participants and the expansion
- Electric isolation of segments
- Commissioning support
 - Segment separation switch
 - 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 9/415.

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	6AG1972-0AA02-7XA0
Based on	6ES7972-0AA02-0XA0 SIPLUS DP RS 485 repeater
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin (incl. condensation/frost)
• max.	70 °C; = Tmax

Article number	6AG1972-0AA02-7XA0
Based on	6ES7972-0AA02-0XA0 SIPLUS DP RS 485 repeater
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

SIPLUS RS 485 repeater for PROFIBUS

Transfer rate up to max. 12 Mbps, 24 V DC, enclosure IP20

Extended temperature range and exposure to media

Article No.

6AG1972-0AA02-7XA0

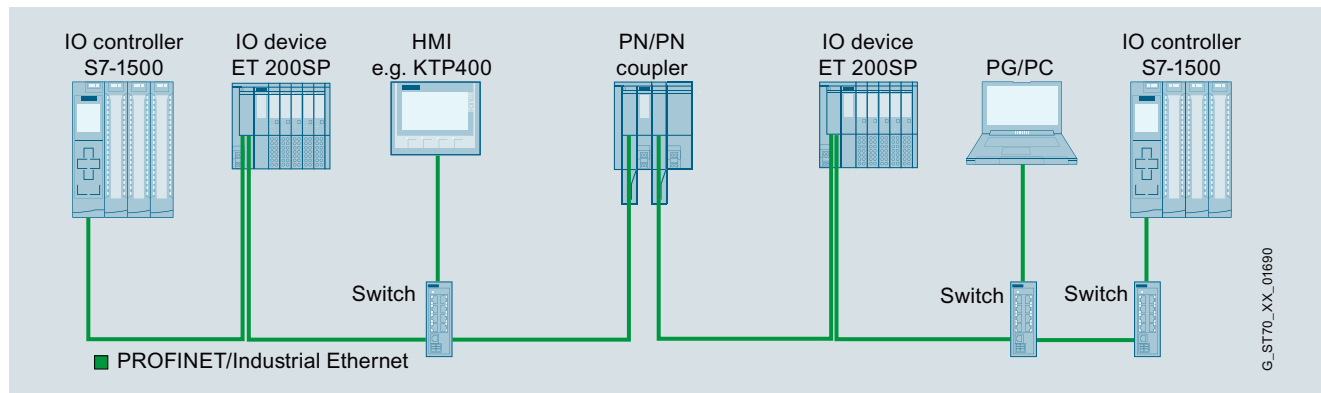
I/O Systems

Network transitions

PN/PN couplers

Overview

- Fast deterministic data exchange between CPUs with PROFINET controller, even beyond network boundaries
- Configuration with two PROFINET devices completely independent of the communication technology



Data transmission between two S7-1500 IO controllers beyond a PROFINET limit

- Very simple configuration of the data exchange via virtual IO modules or alternatively via data records for larger amounts of data
 - Simultaneous data transfer to up to 3 CPUs on own network side and/or up to 4 CPUs on opposite network side
 - Easy to integrate into any PROFINET network with 2 ports per network side
 - Fieldbus connection via a SIMATIC BusAdapter; this allows free selection of the connection system (RJ45, FC cable direct connection) and connection hardware (copper, POF, PCF, glass fiber). FO-to-copper media conversion can also be realized economically and without external converters.
 - Shared device with up to four IO controllers per network side
 - Module-internal shared input / shared output (MSI/MSO)
 - Device replacement without programming device
 - With topological configuration via proximity detection (LLDP)
 - Without topological configuration via redundant storage of the station name in the BusAdapter. A separate removable memory card is not required.
 - Reset button for restoring the factory settings
 - Redundant power supply
 - Galvanic isolation between the two PROFINET IO subnets
 - Media redundancy (MRP and MRPD)
 - I&M data
 - Firmware update
 - Support for Ethernet services (ping, arp, SNMP, MIP-2, LLDP)
 - Comprehensive diagnostics via LED displays and interrupts
 - Extensive compatibility with the PN/PN coupler up to firmware version V3.0
- Additional functions
- Quantity structures
 - Cyclic transmission: Up to 1 440 bytes each for input and output data
 - Data record transfer: Up to 4 096 bytes per slot. Buffering of up to eight data records per slot
 - Maximum 16 input/output areas for data exchange
 - Max. 254 bytes of input and 253 bytes of output data per module
 - Exchange of fail-safe data between two F-CPU's via F-SendDP and F_ReceiveDP

Technical specifications

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
General information	
Product function	
• I&M data	Yes; I&M0 to I&M3
• Tool changer	Yes; Docking station and docking unit
• Local coupling, IO data	Yes
- Number of coupling modules	16
- Number of coupling submodules per module	4; 1x write, 3x read
• Local coupling, data records	Yes
- Number of coupling modules	16
- Number of coupling submodules per module	4; 1x write, 3x read
- Record length, max.	4 096 byte
- FIFO depth in storage mode	8
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	STEP 7 V15.1 or higher
• PROFINET as of GSD version/GSD revision	V2.3
Installation type/mounting	
Mounting	Mounting rail 7.5 mm and 15 mm
Supply voltage	
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
Mains buffering	
• Mains/voltage failure stored energy time	10 ms
Input current	
Current consumption, max.	360 mA; For 19.2 V input voltage at the right-hand supply terminal, including 2 plugged BA 2x LC
from supply voltage 1L+, max.	320 mA; For 19.2 V input voltage at the left-hand supply terminal, including 2 plugged BA 2x LC
Power loss	
Power loss, typ.	4 W; For 24 V input voltage and 2 plugged BA 2x RJ45 If BusAdapters with an optical interface are plugged, there is an additional 750 mW per optical interface (3 W with 2 plugged BA 2x LC)
Address area	
Address space per module	
• Address space per module, max.	254 byte; max. 254 bytes of input data and 253 bytes of output data
Address space per station	
• Address space per station, max.	1 440 byte; per input / output
Hardware configuration	
Submodules	
• Number of submodules per station, max.	116

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
Interfaces	
Number of PROFINET interfaces	2; One PROFINET interface per line side
With optical interface	Yes; Via SIMATIC BusAdapter
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	Yes
• Transmission rate, max.	100 Mbit/s
1. Interface	
Interface types	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring
2. Interface	
Interface types	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring
Interface types	
RJ 45 (Ethernet)	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	No
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes

I/O Systems

Network transitions

PN/PN couplers

Technical specifications (continued)

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
Protocols	
Supports protocol for PROFINET IO	Yes
Protocols (Ethernet)	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes
PROFINET IO Device Services	
- Isochronous mode	No
- Open IE communication	Yes
- IRT	Yes
- PROFinergy	No
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4; per line side
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No; For operation on isochronous bus
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes; Parameterizable
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Connection to network LINK (green)	Yes; 2x green link LEDs on BusAdapter
Isolation	
Isolation tested with	707 V DC (type test)
Standards, approvals, certificates	
Network loading class	3
Security level	According to Security Level 1 Test Cases V1.1.4

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C; = Tmax for horizontal installation; for vertical installation Tmax = 50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m
Mechanics/material	
Strain relief	Yes; Optional, for RJ45 and FC BusAdapter only
Dimensions	
Width	100 mm; Minimized with good handling
Height	117 mm
Depth	74 mm; with mounting rail
Weights	
Weight, approx.	200 g; without BusAdapter

Ordering data	Article No.	Ordering data	Article No.
PN/PN coupler For deterministic data exchange between max. 4 PN controllers per side, also beyond network boundaries Transfer of PROFI-safe, I/O, MSI, MSO and data record communication, redundant power supply; PN connection via SIMATIC BusAdapter (BA) Delivery without BusAdapter	6ES7158-3AD10-0XA0	BA 2XLC BusAdapter PROFINET BusAdapter; 2 glass fiber-optic connections	6ES7193-6AG00-0AA0
Accessories		BA LC/RJ45 BusAdapter PROFINET BusAdapter; with media converter glass FO-CU; 1 x LC connection, 1 x RJ45 connection	6ES7193-6AG20-0AA0
Standard rail 35 mm <ul style="list-style-type: none"> Length: 483 mm for 19" cabinets Length: 530 mm for 600 mm cabinets Length: 830 mm for 900 mm cabinets Length: 2 m 	6ES7110-8MA11 6ES7110-8MA21 6ES7110-8MA31 6ES7110-8MA41	BA LC/FC BusAdapter PROFINET BusAdapter; with media converter glass FO-CU; 1 x LC connection, 1 x FastConnect connection for direct connection of the bus cable	6ES7193-6AG40-0AA0
BusAdapter BA 2xRJ45 PROFINET BusAdapter with standard Ethernet socket	6ES7193-6AR00-0AA0	Equipment labeling plate 10 sheets of 16 labels each	6ES7193-6LF30-0AW0
BusAdapter BA 2xFC PROFINET BusAdapter with FastConnect Ethernet connection; for increased vibration and EMC load capacity	6ES7193-6AF00-0AA0	Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0
BusAdapter BA 2xSCRJ PROFINET BusAdapter with fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	6ES7193-6AP00-0AA0	500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0
BusAdapter BA SCRJ/RJ45 PROFINET BusAdapter; with media converter FO-Cu; 1 x SCRJ FO connection, 1 x RJ45 connection	6ES7193-6AP20-0AA0	1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	6ES7193-6LA10-0AA0
BusAdapter BA SCRJ/FC PROFINET BusAdapter; with media converter FO-Cu; 1 x SCRJ FO connection, 1 x FastConnect connection for direct connection of the bus cable	6ES7193-6AP40-0AA0	1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0
		Spare parts	
		Cover for bus adapter interface 5 units	6ES7591-3AA00-0AA0
		Power supply connector For connecting the 24 V DC supply voltage <ul style="list-style-type: none"> With push-in terminals With screw-type terminals 	6ES7193-4JB00-0AA0 6ES7193-4JB50-0AA0

I/O Systems

Network transitions

PN/CAN LINK

Overview



- For data exchange between PROFINET and CAN Bus 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
 - Node / lifeguarding
 - Heartbeat
 - SYNC (producer / consumer)
- Integrated in TIA via HSP, TIA Portal V14 or higher
- PROFINET switch and 9-pin D-sub plug integrated for CAN
- Up to 126 CAN nodes
- 512 receiver/transmitter PDOs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

Technical specifications

Article number	6BK1620-0AA00-0AA0 SIMATIC PN/CAN LINK
General information	
Product type designation	PN/CAN Link
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V14 or higher
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	Any
Recommended mounting position	Horizontal
Supply voltage	
Type of supply voltage	24 V DC
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
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms
Input current	
Current consumption (rated value)	0.09 A
Current consumption, max.	0.11 A
Power loss	
Power loss, typ.	2.2 W

Article number	6BK1620-0AA00-0AA0 SIMATIC PN/CAN LINK
Interfaces	
Interfaces/bus type	2x Ethernet (RJ45), 1x Sub-D (9-pin)
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
CAN	
• CAN operating modes	CAN Standard CAN 2.0A/B; CANopen Manager / Slave acc. to CiA
• Specification acc. to CiA	CiA 301 & CiA 302
• Transmission rate, min.	50 kbit/s
• Transmission rate, max.	1 000 kbit/s
• Number of slaves, max.	126
• Number of SDOs in parallel	16; Parallel
• Number of PDOs	512; Send / receive
Services	
- Node/life-guarding	Yes
- Heartbeat	Yes
- SYNC	Yes

Technical specifications (continued)

Article number	6BK1620-0AA00-0AA0 SIMATIC PN/CAN LINK
1. Interface	
Interface type	CAN according to CiA 303-1
Physics	9-pin sub D socket
Isolated	Yes; 500 V AC or 707 V DC
Interface types	
• Number of ports	1
2. Interface	
Interface type	PROFINET
Physics	Ethernet, 2-port switch, 2*RJ45
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
PNO certificate	Yes
RoHS conformity	Yes
Marine approval	
• Germanischer Lloyd (GL)	Yes
• American Bureau of Shipping (ABS)	Yes

Article number	6BK1620-0AA00-0AA0 SIMATIC PN/CAN LINK
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	85 °C
Relative humidity	
• Operation, max.	95 %
Software	
Runtime software	
Target system	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	212 g

Ordering data**Article No.**

SIMATIC PN/CAN LINK
PROFINET network transition
according to CAN Bus 2.0A/B,
CANopen Manager according to
CiA301/302, CANopen Slave
according to CiA301/302; IP20

6BK1620-0AA00-0AA0

I/O Systems

Network transitions

SIMATIC PN/J1939 LINK

Overview



- For data exchange between PROFINET and SAE J1939 networks
- J1939 functions:
 - Broadcast Announce Message (BAM)
 - Connection Mode Data Transfer (CMDT)
 - PDU 1 & 2
- Integrated into Totally Integrated Automation via gsdml file in TIA Portal. No separate software required
- Integrated PROFINET switch with 9-pin Sub-D socket for J1939
- Up to 253 logical nodes
- Up to 30 addressable ECUs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

Technical specifications

Article number	6BK1623-0AA00-0AA0 SIMATIC PN/J1939 LINK
General information	
Product type designation	PN/J1939 LINK
Product function	
• I&M data	Yes
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V14 SP1 or higher
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	Any
Recommended mounting position	Horizontal
Supply voltage	
Type of supply voltage	24 V DC
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
Oversvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms; PN side
Input current	
Current consumption (rated value)	0.09 A
Current consumption, max.	0.11 A
Power loss	
Power loss, typ.	2.2 W

Article number	6BK1623-0AA00-0AA0 SIMATIC PN/J1939 LINK
Interfaces	
Interfaces/bus type	2x Ethernet (RJ45), 1x Sub-D (9-pin)
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
CAN	
• CAN operating modes	J1939 according to the standard "SAE J1939"
• Transmission rate, min.	100 kbit/s
• Transmission rate, max.	500 kbit/s
• Number of slaves, max.	30
J1939	
• Addressable ECUs, max.	30
• Logical nodes, max.	253
• PDU 1	Yes
• PDU 2	Yes
• DM – data	Yes
• BAM	Yes
• CMDT	Yes

Technical specifications (continued)

Article number	6BK1623-0AA00-0AA0 SIMATIC PN/J1939 LINK
1. Interface	
Interface type	J1939 according to the standard "SAE J1939"
Physics	9-pin sub D socket
Isolated	Yes; 500 V AC or 707 V DC
Interface types	
• Number of ports	1
2. Interface	
Interface type	PROFINET
Physics	Ethernet, 2-port switch, 2*RJ45
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
PNO certificate	Yes
RoHS conformity	Yes
Marine approval	
• Germanischer Lloyd (GL)	Yes
• Det Norske Veritas (DNV)	Yes

Article number	6BK1623-0AA00-0AA0 SIMATIC PN/J1939 LINK
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	85 °C
Relative humidity	
• Operation, max.	95 %
Software	
Runtime software	
Target system	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	212 g

Ordering data**Article No.**

SIMATIC PN/J1939 LINK
Network transition from PROFINET to J1939 networks; IP20

6BK1623-0AA00-0AA0

I/O Systems

Network transitions

PN/BACnet LINK

Overview



- Gateway between PROFINET and BACnet/IP networks according to EN ISO16484-5 and Addendum ANSI/ASHRAE Standard 135-2012.
- Integrated in Totally Integrated Automation via HSP, TIA Portal V14 or higher
- Integrated PROFINET switch and RJ45 socket for BACnet
- 1 000 BACnet objects/object references

- 1 000 subscribe services
- BACnet features:
 - Client & Server
 - Device profile: B-GW
 - Change of value / cyclic and acyclic data exchange
 - Scan of BACnet/IP network
- Supported BACnet object types:
 - Device
 - Binary input
 - Binary output
 - Analog input
 - Analog output
- Supported BACnet services:
 - DS-COV-A/B
 - DM-DDB-A/B
 - DM-DOB-B
 - DS-RP-A/B
 - DS-WP-A/P
 - GW-EO-B
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

Technical specifications

Article number	6BK1621-0AA00-0AA0 SIMATIC PN/BACnet LINK
General information	
Product type designation	PN/BACnet Link
Product function	
• I&M data	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V14 SP1
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	Any
Recommended mounting position	Horizontal
Supply voltage	
Type of supply voltage	24 V DC
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
Oversvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms
Input current	
Current consumption (rated value)	0.11 A
Current consumption, max.	0.13 A
Power loss	
Power loss, typ.	2.7 W

Article number	6BK1621-0AA00-0AA0 SIMATIC PN/BACnet LINK
Interfaces	
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
BACnet	
• BACnet device profile	B-GW
• Supported character sets	ISO 10646 (UTF-8)
• Network Security	No
1. Interface	
Interface type	BACnet/IP
Physics	RJ45
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• Number of ports	1
2. Interface	
Interface type	PROFINET
Physics	Ethernet, 2-port switch, 2*RJ45
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes

Technical specifications (continued)

Article number	6BK1621-0AA00-0AA0 SIMATIC PN/BACnet LINK
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
PNO certificate	Yes
BTL certificate	Yes
RoHS conformity	Yes

Article number	6BK1621-0AA00-0AA0 SIMATIC PN/BACnet LINK
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	85 °C
Relative humidity	
• Operation, max.	95 %
Software	
Runtime software	
Target system	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
Connection method	
Design of electrical connection	Screw connection
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	210 g

Ordering data**Article No.**

SIMATIC PN/BACnet LINK
Network transition of PROFINET to BACnet/IP networks, device profile B-GW, IP20

6BK1621-0AA00-0AA0

I/O Systems

Network transitions

PN/M-Bus LINK

Overview



- For data exchange between PROFINET and M-Bus networks
- M-Bus functions:
 - M-Bus master
 - Primary address
 - Secondary address
 - Read-only access to M-Bus slaves
 - Short-circuit detection
- Integrated into Totally Integrated Automation via gsdml file in TIA Portal. No separate software required
- Integrated PROFINET switch with 3-pin screw terminal for M-Bus
- Up to 40 slaves (loads/units)
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

Technical specifications

Article number	6BK1622-0AA00-0AA0 SIMATIC PN/M-Bus LINK
General information	
Product type designation	PN/M-Bus LINK
Product function	
• I&M data	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	STEP 7 V15 or higher
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	Any
Recommended mounting position	Horizontal
Supply voltage	
Type of supply voltage	24 V DC
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
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms; PN side
Input current	
Current consumption (rated value)	0.11 A; At 24 V and 5 loads
Current consumption, max.	0.4 A; At 20.4 V, 40 loads + 100 mA short-circuit current
Power loss	
Power loss, typ.	2.4 W

Article number	6BK1622-0AA00-0AA0 SIMATIC PN/M-Bus LINK
Interfaces	
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
M-Bus	
• Bus voltage, typ.	36 V
• Transmission rate, min.	300 bit/s
• Transmission rate, max.	9 600 bit/s
• Number of slaves, max.	40
• Short-circuit detection	Yes
• short-circuit proof	Yes
• Connectable conductor cross-section	1.5 mm ²
• Cable length, max.	300 m
1. Interface	
Interface type	M-Bus master
Physics	3-wire screw-type terminal
Isolated	No
Interface types	
• Number of ports	1
2. Interface	
Interface type	PROFINET
Physics	Ethernet, 2-port switch, 2*RJ45
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No

Technical specifications (continued)

Article number	6BK1622-0AA00-0AA0 SIMATIC PN/M-Bus LINK	Article number	6BK1622-0AA00-0AA0 SIMATIC PN/M-Bus LINK
Interrupts/diagnostics/ status information		Ambient conditions	
Status indicator	Yes	Ambient temperature during operation	
Alarms	Yes	• horizontal installation, min.	-25 °C
Diagnostics function	Yes	• horizontal installation, max.	60 °C
Diagnostics indication LED		• vertical installation, min.	-25 °C
• RUN LED	Yes	• vertical installation, max.	55 °C
• ERROR LED	Yes	• ceiling installation, min.	-25 °C
• MAINT LED	Yes	• ceiling installation, max.	45 °C
• LINK LED	Yes	• floor installation, min.	-25 °C
• RX/TX LED	Yes	• floor installation, max.	45 °C
Potential separation		Ambient temperature during storage/transportation	
Potential separation exists	Yes	• min.	-40 °C
Degree and class of protection		• max.	70 °C
Degree of protection acc. to EN 60529	IP20	Relative humidity	
Standards, approvals, certificates		• Operation, max.	95 %
CE mark	Yes	Software	
RoHS conformity	Yes	Runtime software	
		Target system	
		- ET 200SP	Yes
		- Open Controller	Yes
		- S7-1200	Yes
		- S7-1500	Yes
		Dimensions	
		Width	70 mm
		Height	112 mm
		Depth	75 mm
		Weights	
		Weight, approx.	215 g

Ordering data**Article No.**

SIMATIC PN/M-Bus LINK
PROFINET gateway to
M-Bus networks; M-Bus master,
IP20

6BK1622-0AA00-0AA0

I/O Systems

Network transitions

IE/AS-i Link PN IO

Overview



IE/AS-i Link PN IO: Single master (left) and Double master (right)

PN	DP-M	DP-S	AS-i M		
●			●		

The IE/AS-i Link PN IO is a compact router between PROFINET and AS-Interface, with the following features:

- Single and double AS-Interface master (according to AS-Interface Specification V3.0) for connection of 62 AS-Interface slaves or 124 AS-Interface slaves (with a double master)
- Integrated analog value transmission
- Integrated ground-fault monitoring for the AS-Interface cable
- User-friendly local diagnostics and start-up by means of a full graphic display and control keys or through a web interface with a standard browser on the PC screen
- Vertical integration (standard web interface) through Industrial Ethernet
- Supply via AS-Interface cable or with 24 V DC
- Suitable for AS-Interface with 30-V voltage and AS-i Power24V
- Module exchange without entering the PROFINET connection parameters when using the C-PLUG (optional)
- Costs saved by the double AS-Interface master when large volumes of project data are involved

Note:

As an alternative to the IE/AS-i Link PN IO, a high-performance router can be set up between PROFINET and AS-Interface by combining the CM AS-i Master ST and F-CM AS-i Safety ST modules in an ET 200SP station (for safety-related applications), see page 9/122 and page 9/174

Design

- Compact plastic enclosure in degree of protection IP20 for standard rail mounting
- COMBICON plug-in screw terminals
- Compact design
- Pixel graphics display in the front panel for detailed display of the operating state and readiness for operation of all connected AS-Interface slaves
- Six pushbuttons for starting up and testing the AS-Interface line directly on the IE/AS-i Link PN IO
- LED display of the operating state of PROFINET IO and AS-Interface
- Integrated 2-port switch (RJ45 socket) for connection to Industrial Ethernet
- Small mounting depth thanks to recessed plug mounting
- Operation without fans and batteries

Functionality

Communication

The IE/AS-i Link PN IO allows a PROFINET IO controller to cyclically access the I/O data of all slaves of a subordinate AS-Interface segment. Also supported are the expanded slave types with higher I/O data volume according to AS-i Specification V3.0.

The IE/AS-i Link PN IO occupies the following address area:

- As a single master with full expansion: 62 bytes of input data and 62 bytes of output data in which the digital I/O data of the connected AS-Interface slaves (standard and A/B addressing) of an AS-i line is stored.
- Double the number of bytes as double master
- Optional additional I/O bytes for data from analog slaves

The size of the input/output image can be compressed so that only the actually required I/O address area is occupied in the system of the IO controller.

The integrated evaluation of analog signals is just as easy as access to digital values because the analog process data also lie directly in the I/O address area of the CPU.

PROFINET IO controllers are additionally able to initiate AS-Interface master calls (e.g. to write parameters, change addresses, read diagnostic values) through the acyclic PROFINET services.

Using an operating display in AS-Interface Link it is possible to fully commission the lower-level AS-i line.

The IE/AS-i Link PN IO is equipped with two Ethernet ports, which are connected by an internal switch. With the Ethernet it is possible in addition to use the integrated web server. The web server can be called up with any standard web browser (e.g. Internet Explorer) without additional software. It enables the PC to present all diagnostics information and to display the set bus configuration and parameters as well as their adaptation where applicable. Firmware updates are also possible using this port.

The optional C-PLUG supports module replacement without manually entering the connection parameters (PROFINET device name), keeping downtimes to a minimum in the event of a fault.

Overview (continued)Diagnostics

The following diagnostics is possible using the display and control keys, web interface or STEP 7:

- Operating state of the IE/AS-i Link PN IO
- State of the link as a PROFINET IO device
- Diagnostics of the AS-Interface network
- Message frame statistics
- Standard diagnostics pages in the web interface for fast diagnostics access through Ethernet using a standard browser
- Reporting of diagnostic events is optionally possible via email or SNMP trap. The integrated diagnostic buffer saves the events including time stamp.

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions only represent one component of such a concept.

For more information on Industrial Security, see <http://www.siemens.com/industrialsecurity>.

Configuration

The IE/AS-i Link PN IO is configured as follows:

- With STEP 7 (TIA Portal) V15 or higher or STEP 7 (classic) V5.4 or higher: When configuring in STEP 7, the AS-Interface configuration can be uploaded in STEP 7 V5.4 SP2 and higher. Furthermore, AS-Interface slaves from Siemens can also be conveniently configured in HW Config (slave selection dialog).
- Alternatively, IE/AS-i Link PN IO can be integrated in the engineering tool by means of the PROFINET GSD file (e.g. for TIA Portal versions lower than V15, for STEP 7 versions lower than V5.4 SP2, or for non-Siemens engineering tools).

Benefits

- Short startup times through simple configuration at the touch of a button and testing the AS-Interface line using the display or web interface
- Reduction of standstill and servicing times in the event of a slave failure thanks to user-friendly diagnostics using the display or web interface
- Costs saved by the double AS-Interface master when large volumes of project data are involved
- Simple operation with AS-Interface power supply unit (see <https://mall.industry.siemens.com/mall/en/WWW/Catalog/Products/8200165?tree=CatalogTree>) without restrictions, no further operating voltage is required.
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is powered through an existing 24 V DC PELV power supply unit. An S22.5 AS-i data decoupling module (e.g. 3RK1901-1DE12-1AA0) is required for the decoupling, see <https://mall.industry.siemens.com/mall/en/WWW/Catalog/Products/10057533?tree=CatalogTree>.
- For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see <https://support.industry.siemens.com/cs/ww/en/view/61892138>.

Application

The DP/AS-i Link PN IO is a PROFINET IO device (according to IEC 61158 / IEC 61784) and an AS-Interface master (based on AS-Interface Specification V3.0 according to IEC 62026-2). It enables transparent data access to AS-Interface from Industrial Ethernet.

Exchanging data with PROFINET IO controllers

PROFINET IO controllers can exchange I/O data with AS-Interface in cyclic mode and can perform AS-i master calls in addition with acyclic services (e.g. reading/writing the AS-i configuration during normal operation). IE/AS-i Link PN IO is, therefore, suitable for distributed configurations and for integrating a lower-level AS-Interface network.

Single master

The AS-i single master version of IE/AS-i Link PN IO is suitable for applications with typical volumes of data. The single master can operate up to 248 DI / 248 DO, using 62 A/B slaves with 4 DI / 4 DO each.

Double master

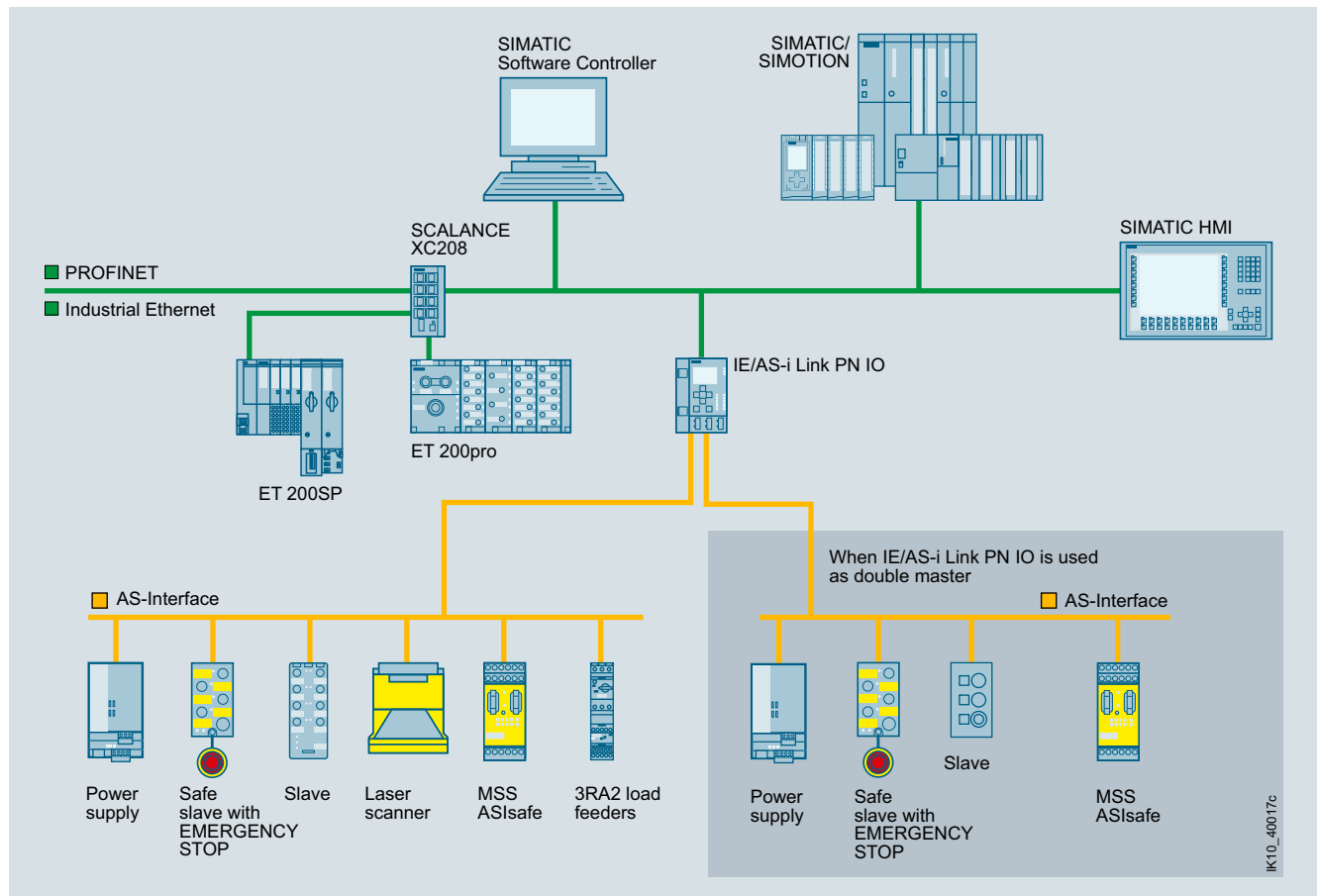
The AS-i double master version of IE/AS-i Link PN IO is suitable for applications with large volumes of data. In this case, twice the volume of project data can be used on two AS-i lines running independently of each other. The double master can operate up to 496 DI / 496 DO, using two AS-i networks each with 62 A/B slaves with 4 DI / 4 DO each.

I/O Systems

Network transitions

IE/AS-i Link PN IO

Application (continued)



Integration of AS-Interface on PROFINET through IE/AS-i Link PN IO as single/double master

Ordering data

Article No.

Article No.

IE/AS-i Link PN IO

Router between PROFINET and AS-Interface in degree of protection IP20; including COMBICON plug-in screw terminals for connecting an AS-Interface cable (two AS-Interface cables for a double master) and the optional 24 V supply; complies with AS-Interface Specification V3.0; dimensions (W x H x D / mm): 90 x 132 x 88.5

COMBICON connection

- Single master with display
- Double master with display

6GK1411-2AB10
6GK1411-2AB20

Accessories

C-PLUG

Exchange medium for the simple exchange of devices in the event of a fault; for accommodating configuration and application data; can be used in SIMATIC NET products with a C-PLUG slot

6GK1900-0AB00

IE FC RJ45 plug 90

RJ45 plug-in connector for Industrial Ethernet, with rugged metal enclosure and integrated insulation displacement contacts for connection of Industrial Ethernet FC installation cables; with 90° cable feeder

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

6GK1901-1BB20-2AA0
6GK1901-1BB20-2AB0
6GK1901-1BB20-2AE0

More information

Manual, see
<https://support.industry.siemens.com/cs/ww/en/view/22712154>

AS-Interface block library for SIMATIC PCS 7 for simple connection of AS-Interface to PCS 7, see
<https://support.industry.siemens.com/cs/ww/en/view/109759605>

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
Note:

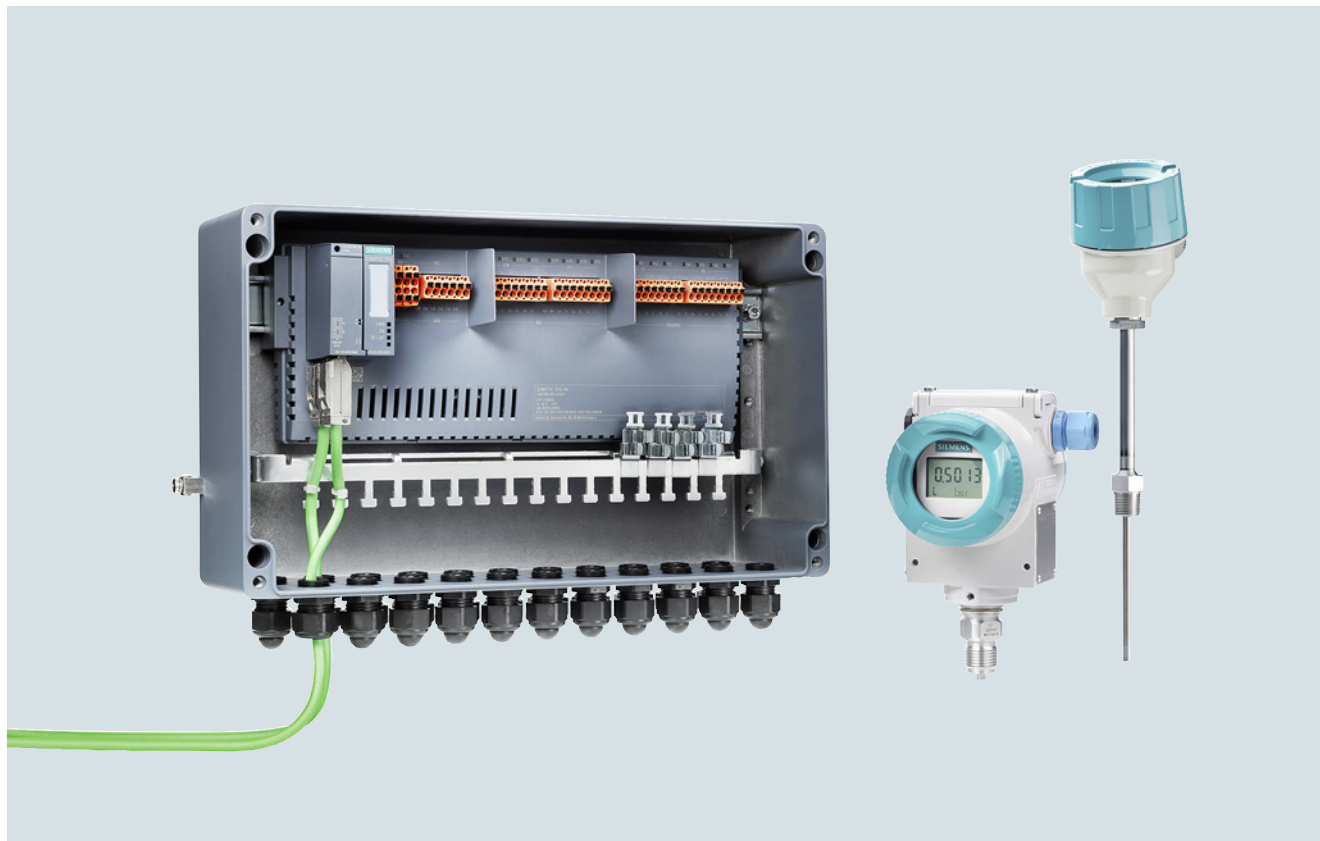
The manual is available free on the Internet.

I/O Systems

Network transitions

SIMATIC CFU

Overview



9

The SIMATIC Compact Field Unit (SIMATIC CFU) is a smart field distributor for use as an I/O device on PROFINET of an automation system. SIMATIC CFU has the following interfaces:

- Fieldbus connections for PROFIBUS PA field devices
- Freely configurable channels (digital inputs/outputs for sensors or actuators)

The SIMATIC CFU is a real game changer in field device connection and offers entirely new prospects regarding simplicity and flexibility. This compact field distributor is installed at the process level and is connected via PROFINET directly to the controller to form the foundation for digitalization in the field. Utilization of digital fieldbus communication simplifies device interfacing considerably compared to conventional 4 to 20 mA engineering.

Plug-and-produce simplicity

Digitalization requires a digital infrastructure facilitating integrated digital communication right down to the sensors and actuators. This can be built up using the tried and tested, standard PROFIBUS PA which has been incorporated into the PA Edition of the SIMATIC CFU, thus combining ruggedness and simplified handling with all the advantages of the PROFINET standard based on Industrial Ethernet. Connected devices are addressed automatically, and integration is simple via standardized communication profiles.

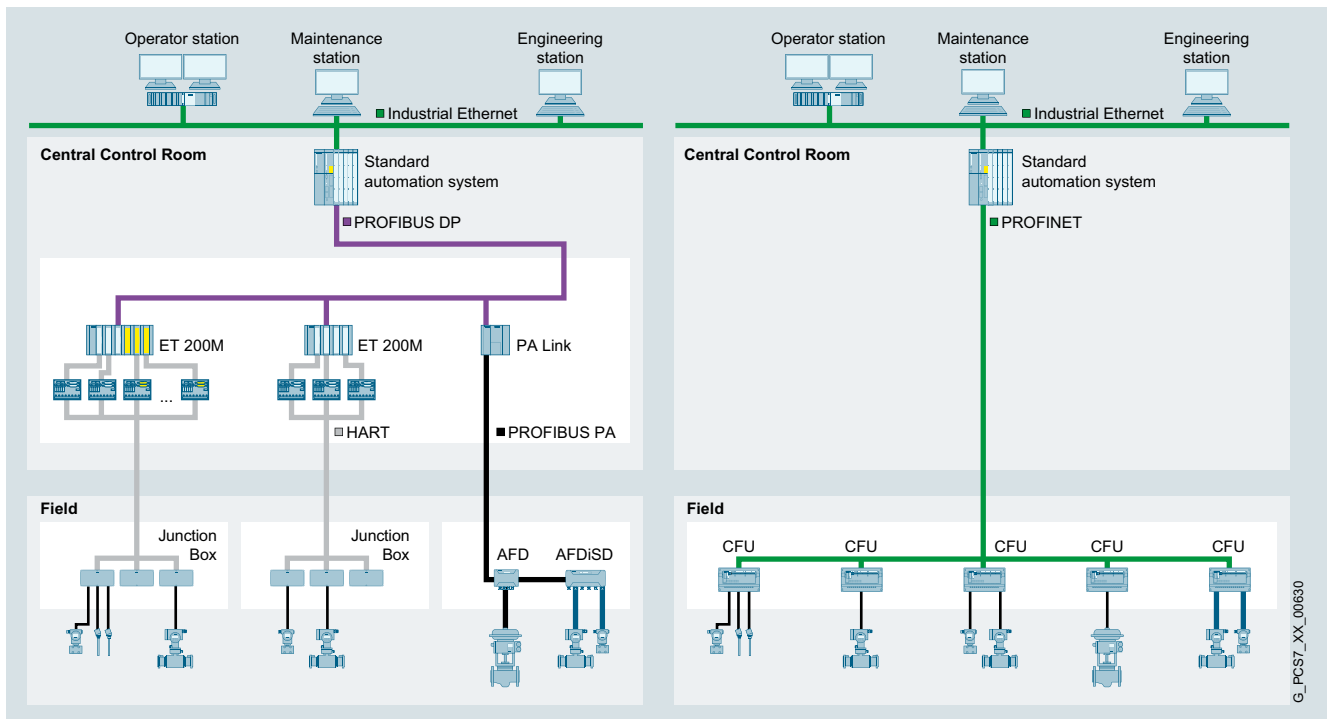
This innovative new implementation of the PROFIBUS PA concept makes it possible to combine the simplicity of a point-to-point wiring system with the scalability of digital PROFIBUS PA fieldbus communication.

As with digital field devices, it is not necessary to know prior to connection whether the discrete field device is a sensor or actuator – this can be easily configured afterwards with software.

Greater flexibility thanks to consistent decentralization

Thanks to the distributed installation of the SIMATIC CFU, classic control cabinets are no longer required and you can make considerable savings in cabling and the number of terminal points as well as reducing planning and documentation overheads. The high granularity (16 I/O per SIMATIC CFU) enables flexible assignment to the higher-level controllers.

Overview (continued)



Field device connection with previous technology (left) and with SIMATIC CFU (right)

Most important functionsSystem interfacing over the Industrial Ethernet standard

- Redundant PROFINET connection (S2) for maximum availability
- Connection versatility with PROFINET BusAdapter (for example electrical, optical or mixed)

Combination of digital fieldbus and discrete I/Os

- 8 × digital fieldbus (PROFIBUS PA)
- 8 × digital inputs/outputs, freely configurable

Ready for distributed use

- For installation in hazardous areas up to zone 2-22
- Extended temperature range of -40 to +70 °C
- Conformal coating
- Can be used at altitudes of up to 4 000 meters
- Enhanced interference immunity in accordance with NAMUR recommendation NE21

Easy to use

- Automatic addressing of PROFIBUS PA field devices
- System-supported detection and integration of PROFIBUS PA field devices into the process control system with the use of standardized PA profiles and commissioning, device replacement and service wizards
- Implementation of diagnostic messages in accordance with NAMUR recommendation NE107
- 35-mm mounting onto standard rail

Configuring with SIMATIC PCS 7 and third-party systems

See information in the Siemens Industry Online Support

<https://support.industry.siemens.com/cs/ww/en/view/109749357>

I/O Systems

Network transitions
SIMATIC CFU

Bundles, accessories

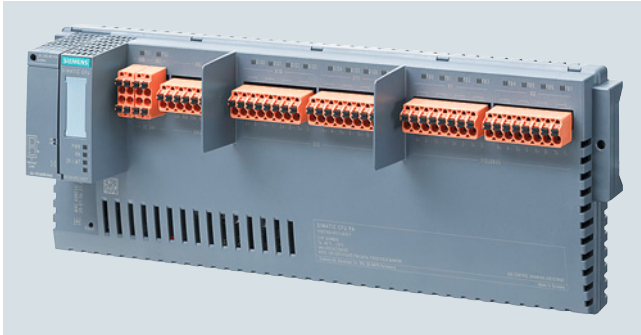
Overview Bundles

For SIMATIC CFU PA, a pre-installed bundle is offered, with SIMATIC CFU PA basic device and SIMATIC CFU push-in terminals.

SIMATIC CFU PA bundle

Comprising:

- SIMATIC CFU PA, Article no. 6ES7655-5PX11-0XX0
- SIMATIC CFU push-in terminals, Article no. 6ES7655-5PX00-1XX0



SIMATIC CFU PA bundle

Ordering data

Article No.

SIMATIC CFU PA bundle

Comprising:

- SIMATIC CFU PA, Article No. 6ES7655-5PX11-0XX0
- SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0

pre-assembled and tested

6ES7655-5PX11-1XX0

SIMATIC CFU PA bundle with aluminum enclosure

Comprising:

- SIMATIC CFU PA, Article No. 6ES7655-5PX11-0XX0
- SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0
- Aluminum enclosure with cable glands, shield busbar, shield connection clamps

pre-assembled and tested

6ES7655-5PX11-1AX0

Overview Accessories



BusAdapter BA 2xRJ45, 2xFC and 2xLC

BusAdapter

A BusAdapter as a separate component allows a free choice of SIMATIC CFU connection to PROFINET:

- BA 2xRJ45:
2 electrical connections for bus cable with standard RJ45 connector
- BA 2xFC:
2 electrical connections for direct connection of FastConnect bus cable
- BA 2xLC:
2 optical ports for fiber-optic cables

Technical specifications

Article number	6DL1193-6AR00-0AA0 ET 200SP HA, BUSADAPTER BA 2XRJ45	6DL1193-6AF00-0AA0 ET 200SP HA, BUSADAPTER BA 2XFC	6DL1193-6AG00-0AA0 ET 200SP HA, BUSADAPTER BA 2XLC
General information			
Product type designation	BA 2x RJ45	BA 2xFC	BA 2XLC
Interfaces			
Number of PROFINET interfaces	1; 2 ports (switch) RJ45	1; 2 ports (switch) FC	1; 2 ports (switch) LC Multimode Glass Fibre
Supports protocol for PROFINET IO			
<ul style="list-style-type: none"> Number of RJ45 ports Number of FC (FastConnect) connections Number of LC ports 	2	2	2
Cable length			
- Cu conductors	100 m	100 m	
- Multimode graded-index fiber 50/125 µm			3 km
- Multimode graded-index fiber 62.5/125 µm			3 km
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	65 °C; Redundant design (2x 6DL1155-6AU00-0PM0): max. 60 °C horizontal, max. 50 °C vertical. When using different I/O devices, the derating specified there must be observed.
Dimensions			
Width	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	75 mm; Without protective caps (approx. 8 mm)
Depth	59 mm	59 mm	59 mm
Weights			
Weight, approx.	46 g	53 g	60 g

Ordering data

	Article No.		Article No.
BusAdapter		Connection technology	
BusAdapter BA 2xRJ45 2 x RJ45 connections for PROFINET (standard Ethernet socket)	6DL1193-6AR00-0AA0	SIMATIC CFU screw-type terminals Complete set of screw-type terminals for SIMATIC CFU: two-tier 2x2 (24 V), single-tier 1x6 (GND) and single-tier 4x8 (IO)	6ES7655-5PX00-2XX0
BusAdapter BA 2xFC 2 x FastConnect (FC) connections for PROFINET	6DL1193-6AF00-0AA0	SIMATIC CFU push-in terminals Complete set of push-in terminals for SIMATIC CFU: two-tier 2x2 (24 V), single-tier 1x6 (GND) and single-tier 4x8 (IO)	6ES7655-5PX00-1XX0
BusAdapter BA 2xLC 2 x glass fiber-optic connections	6DL1193-6AG00-0AA0		
Shield terminals for aluminum field enclosure			
SIMATIC CFU shield terminals 4 shield terminals as an optional accessory for SIMATIC CFU aluminum field housing, for simple and secure shielding of up to 8 PROFIBUS PA field devices	Not yet available 6ES7655-5PX00-0XX1		

