

# Distributed I/Os

## SIMATIC ET 200

# 6



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# SIMATIC ET 200 distributed I/Os

## ET 200S

### Analog electronics modules

#### Overview



- Analog inputs and outputs for the ET 200S
- Can be connected to the TM-E terminal module with automatic coding
- High-feature versions with enhanced accuracy and resolution
  - 2 AI RTD High Feature
- High-speed versions for high-speed analog value acquisition
  - 2 AI High Speed with enhanced characteristics
- Module replacement during operation and when live (hot swapping)

**Note:**

For selection of suitable TM-E terminal modules, please use the configuring tools.

#### Technical specifications

<b>Analog input</b>	<b>6ES7 134-4GD00-0AB0</b>
<b>Voltages and currents</b>	
Load voltage L+	
- Rated value (DC)	24 V; from power module
- Reverse polarity protection	Yes
Power supply of measuring transducers	
- Available	Yes; automatically set
- Short-circuit proof	Yes; automatically set
<b>Current consumption</b>	
• from load voltage L+ (no load), max.	125 mA
• from backplane bus 3.3 V DC, max.	10 mA
• Power dissipation, typical	0.6 W
<b>Address area</b>	
Address space per module	
- Address space per module, max.	8 byte
<b>Clock synchronism</b>	
• Clock synchronous operation	No; automatically set
<b>Analog inputs</b>	
• Number of analog inputs	4
• Length of cable shielded, max	200 m
• Permiss. input voltage for voltage input (destr. limit), max.	-
• Perm. input volt. for the current input (destr. lim.), max.	30 mA
• Measuring current	-
• Cycle time (all channels)	40 ms; deactivation of the channels brings no reduction
• Technical unit for temperature measurement can be set	-
Input ranges (rated values), voltages	
• Voltage	-
• 1 to +5 V	-
• -10 V to +10 V	-
• -5 V to +5 V	-
• -80 mV to +80 mV	-
• Input resistance (-80 mV to +80 mV)	-
Input ranges (rated values), currents	
• Current	Yes
• Input resistance (0 to 20 mA)	-
• -20 to +20 mA	No
• 4 to 20 mA	Yes

#### Technical specifications (continued)

Analog input	6ES7 134-4GD00-0AB0
<b>Analog value formation</b>	
• Measuring principle	-
Integration and conversion time/trigging per channel	
• with over-range (bits incl. sign), max	13 bit; 4 to 20 mA: 13 bit
• Integration time parameterizable	Yes; automatically set
• Integration time, ms	16.7 or 20
• Interference voltage suppr. for interference frequency f1 in Hz	60 / 50 Hz
• Conversion time (per channel)	-
Smoothing of measured values	
• Parameterizable	Yes; in 4 steps
• None	Yes; 1x cycle time
• Weak	Yes; 4x cycle time
• Medium	Yes; 16x cycle time
• Strong	Yes; 32x cycle time
<b>Sensor</b>	
Sensing element connection	-
• for voltage measurement	-
• for current measurement, as 2-wire measuring transducer	-
• for resistance measurement, with 2-wire connection	-
• for resistance measurement, with 3-wire connection	-
• for resistance measurement, with 4-wire connection	-
• Load of the 2-wire transducer, max.	750 Ω
<b>Error/accuracies</b>	
• Linearity error (relative to the input range)	+/- 0,01 %
• Temperature error (relative to the input range)	+/- 0,003 %/K
• Crosstalk between the inputs, min.	-50 dB
• Repeatab. in the settled state at 25 °C (rel. to output range)	+/- 0,05 %
Operational limit in the entire temperature range	
• relative to the input range, voltage	-
• relative to the input range, current	+/- 0,4 %
• relative to the input range, resistance thermometer	-
Basic error limit (operational limit at 25 °C)	
• relative to the input range, voltage	-
• relative to the input range, current	+/- 0,3 %
• relative to the input range, resistance thermometer	-
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$	
• Series-mode interference (peak value of interference < rated value)	70 dB
• Common-mode interference (USS < 2.5 V) , min.	-

Analog input	6ES7 134-4GD00-0AB0
<b>Parameters</b>	
• Comment	-
• Wire break diagnostics	Yes
• Measurement type/Measuring range	Yes
• Interference frequency suppression	-
• Group diagnostics	Yes
• Reference junction slots 1 to 8	-
• Overflow/underflow	Yes
• Reference junction	-
• Reference junction number	-
• Unit	-
<b>Status information/ interrupts/ diagnostics</b>	
Interrupts	
- Process interrupt	-
Diagnostics	
• Diagnostic functions	Yes; automatically set
• Diagnostic information can be read out	-
• Wire break	Yes
• Group error	Yes
• Overflow/underflow	Yes
Diagnostic display LED	
• Group fault SF (red)	Yes
<b>Insulation</b>	
• Insulation tested with	500 V DC
<b>Galvanic isolation</b>	
Analog output functions	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	No
<b>Permissible potential difference</b>	
• between the inputs (UCM)	-
• between the inputs and MANA (UCM)	-
• between MANA and Minternal (UISO)	-
<b>Dimensions and weight</b>	
• Weight, approx.	40 g
• Width	15 mm
• Height	81 mm
• Depth	52 mm
• Module width, max.	15 mm

# SIMATIC ET 200 distributed I/Os

## ET 200S

### Analog electronics modules

#### Ordering data

#### Order No.

##### Analog input modules

A

Ordering unit 1 item

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

6ES7 134-4FB01-0AB0  
 6ES7 134-4FB51-0AB0  
 6ES7 134-4LB00-0AB0  
 6ES7 134-4GB01-0AB0  
 6ES7 134-4GB51-0AB0  
 6ES7 134-4GB11-0AB0  
 6ES7 134-4GB61-0AB0  
 6ES7 134-4MB00-0AB0  
 6ES7 134-4JB50-0AB0  
 6ES7 134-4JB00-0AB0  
 6ES7 134-4NB50-0AB0  
 6ES7 134-4NB00-0AB0  
 6ES7 134-4GD00-0AB0 **NEW**

##### Analog output modules

A

Ordering unit 1 item

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

6ES7 135-4FB01-0AB0  
 6ES7 135-4LB01-0AB0  
 6ES7 135-4GB01-0AB0  
 6ES7 135-4MB01-0AB0

A) Subject to export regulations: AL: N and ECCN: EAR99H

#### Order No.

##### Accessories for labeling

##### DIN A4 labeling sheet

- Petrol
- Red
- Yellow
- Light beige

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

##### Accessories for system-integrated shield connection

##### Shield connection element

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

6ES7 193-4GA00-0AA0

##### Shield clamps

Ordering unit 5 items  
 For 3 × 10 mm busbars

6ES7 193-4GB00-0AA0

##### Grounding terminal

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

8WA2 868

##### 3 × 10 mm busbars

Ordering unit 1 item

8WA2 842

#### Overview

- Positioning module 1 POS U is a single-channel positioning module for ET 200S for the positioning of positioning and operational axes
- For controlled positioning using digital outputs according to the rapid/creep feed principle
- With actual position value sensing for
  - Incremental encoders with 5 V difference signals or 24 V signals, or for SSI encoders
  - Proportioning mode (single evaluation of encoder signal A only)
- Reference-point approach, actual value setting
- Parameter change during operation
  - Reversing difference
  - Shutdown difference
- Functions
  - Inching:  
Direct application of control signals by the master
  - Traversing:  
Absolute or relative
  - Axes:  
For linear and rotary axes
  - Latch function:  
Saves the current value by setting a digital input

#### Note

Siemens is offering position measuring systems and pre-assembled connecting cables for counting and positioning functions under SIMODRIVE Sensor or Motion Connect 500.

# SIMATIC ET 200 distributed I/Os

## ET 200S – Technology modules

### 1 POS U positioning module

#### Technical specifications

1 POS U positioning module	6ES7 138-4DL00-0AB0
<b>Voltagages and currents</b>	
Load voltage L+	
- Rated value (DC)	24 V
- Reverse polarity protection	Yes
- permissible range, lower limit (DC)	20.4 V
- permissible range, upper limit (DC)	28.8 V
<b>Current consumption</b>	
• from load voltage L+ (no load), max.	50 mA
• from backplane bus 5 V DC, max.	10 mA
• Power dissipation, typ.	2 W
<b>Digital inputs</b>	
Length of cable	
- Length of cable unshielded, max	50 m
• Input characteristic to comply with IEC 1131, Type 2	Yes
Input voltage	
- Rated value, DC	24 V
- for signal 0	-30 V to 5 V
- for signal 1	11 V to 30 V
Input current	
- for 0 signal, max (permissible closed-circuit current)	2 mA
- for 1 signal, typical	9 mA
<b>Digital outputs</b>	
• Length of cable shielded, max.	1,000 m
• Length of cable unshielded, max.	600 m
• Short-circuit protection of the output	Yes
- response threshold, typ.	0.7 A to 1.8 A
• Restriction of the inductive transient voltage to	Yes; L+ -(55 ... 60 V)
• Lamp load, max.	5 W
• Driving a digital input	Yes
Output voltage	
- Rated value (DC)	24 V
- for 0 signal (DC), max.	3 V
- for signal 1, min.	L+ -1 V
Output current	
- for 1 signal permissible range for 0 to 60 °C, min.	7 mA
- for 1 signal permissible range for 0 to 60 °C, max.	600 mA
- for 0 signal residual current, max.	0.3 mA
Switching frequency	
- at resistive load, max.	100 Hz
- at inductive load, max.	2 Hz
- at lamp load, max.	10 Hz

1 POS U positioning module	6ES7 138-4DL00-0AB0
<b>Sensor supply</b>	
5 V - sensor supply	
- 5 V	Yes
- Short-circuit protection	Yes
- Output current, max.	500 mA
24 V - sensor supply	
- 24 V	Yes
- Short-circuit protection	Yes
- Output current, max.	500 mA
Absolute encoder (SSI) - sensor supply	
- Absolute encoder (SSI)	Yes
- Output voltage	L+ -0.8 V
- Output current, max.	500 mA
- Short-circuit protection	Yes
<b>Sensor</b>	
Connectable encoders	
- Absolute encoder (SSI)	Yes
- 2-wire BEROs	Yes; Type 2
Incremental encoder (symmetrical)	
• Encoder signal 5 V	
- signal level	according to RS 422
Absolute encoder (SSI)	
• Updating of the encoder value	
- Monoflop time	64 ms
<b>Status information/ interrupts/ diagnostics</b>	
Diagnostic display LED	
- Actual value decreasing DN (green)	Yes
- Actual value increasing UP (green)	Yes
- Positioning mode POS (green)	Yes
- Group fault SF (red)	Yes
- Status display digital input (green)	Yes
<b>Potentials/ electrical isolation</b>	
• between backplane bus and all other circuit components	Yes
• between the channels and the backplane bus	Yes
<b>Dimensions and weight</b>	
• Weight, approx.	65 g
• Width	30 mm
• Height	81 mm
• Depth	52 mm

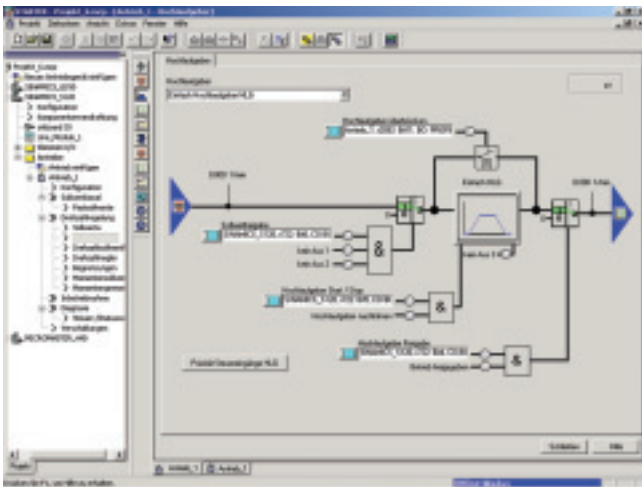
#### Ordering data

#### Order No.

**Positioning module 1 POS U**  
Single-channel positioning module for ET 200S for positioning the adjustment and operation axes

**6ES7 138-4DL00-0AB0**

#### Overview



The easy-to-use STARTER drive/commissioning software can be used to

- start up,
- optimize and
- diagnose.

This software can be operated either as a stand-alone PC application or can be integrated into the SCOUT engineering system (SIMOTION). The basic functions and handling are the same in both cases.

In addition to the SINAMICS drives, the current version of STARTER also supports MICROMASTER 4 drives and frequency converters for the decentralized SIMATIC ET 200S FC periphery.

The project wizards can be used to create the drives within the structure of the project tree.

First-time users are supported by a solution-based dialog menu, with a standard graphics-based display maximizing clarity when setting the drive parameters.

First commissioning is guided by wizards, which make all the basic settings in the drive. This enables a drive to be up and running after only setting a small number of parameters within the drive configuration process.

The individual settings required are made using graphics-based parameterization screenforms, which also display the mode of operation.

Examples of individual settings that can be made include:

- terminals
- bus interface
- setpoint channel (e.g. fixed setpoints)
- speed control (e.g. ramp-function generator, limits)
- BICO interconnections
- diagnostics

Experts can gain rapid access to the individual parameters via the Expert List and do not have to navigate dialogs. In addition, the following functions are available for optimization purposes:

- self-optimization
- trace

Diagnostics functions provide information about:

- control/status words
- parameter status
- operating conditions
- communication states

#### Performance

- Easy to use: only a small number of settings need to be made for successful first commissioning: axis turning
- Solution-based dialog-based user guidance simplifies commissioning.
- Self-optimization functions reduce manual effort for optimization.
- The built-in trace function provides optimum support during commissioning, optimization and troubleshooting.

#### Minimum hardware and software requirements

- PG or PC with Pentium™ II 400 MHz (Windows™ NT/2000)
- Pentium™ III 500 MHz (Windows™ XP)
- 256 MB RAM
- Monitor resolution 1024 × 768 pixels
- Windows™ NT 4.0 SP6, 2000 SP3, XP Professional SP1
- Microsoft Internet Explorer 5.01

For the communication between PG/PC and the Control Unit CU320 a PROFIBUS communication module and a connection cable are required.

E. g. PROFIBUS CP 5512 communications module (PCMCIA card, type 2 + adapter with 9-pole SUB-D socket for connection to PROFIBUS).

For MS Windows 2000/XP Professional and PCMCIA 32)  
Order No.: 6GK1551-2AA00

and connection cable between CP 5512 and PROFIBUS  
Order No.: 6ES7901-4BD00-0XA0

#### Ordering data

#### Order No.

**STARTER commissioning tool** B **6SL3 072-0AA00-0AG0**  
for SINAMICS and  
MICROMASTER  
German/English

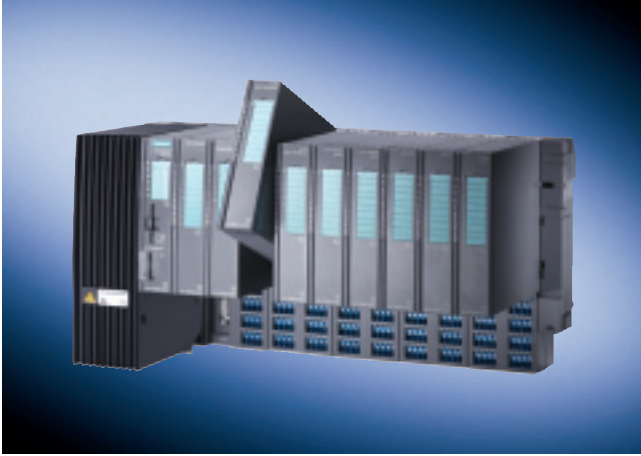
B) Subject to export regulations: AL: N and ECCN: EAR99S

# SIMATIC ET 200 distributed I/Os

## ET 200iSP

### Introduction

### Overview



- Modular distributed I/O system with degree of protection IP30
- Suitable for use in potentially explosive atmospheres Zone 1
- Increased-safety type according to CENELEC: II 2 G (1) GD EEx d e [ib/ia] IIC T4
- Design and version according to ATEX 100 a
- Connection of intrinsically safe signals for gas (from Zone 2, 1 or 0)
- Connection of intrinsically safe signals for dust (from Zone 20, 21 or 22)
- Intrinsically safe design of electronic modules
- Intrinsically safe PROFIBUS connection
- Redundant configuration of PROFIBUS interface and power supply also possible
- Online expansion and reparameterization in the SIMATIC environment
- Firmware update over the bus
- Better information is now available about the modules thanks to the I&M data stored on each module (Information & Maintenance data)
- Acquisition of count pulses and acquisition of frequencies
- Replacement of all electronic modules (as well as power supply and bus connection modules) when live during runtime and under hazardous conditions in zone 1 (hot swapping)
- Function orientated station design with up to 32 electronic modules per station
- Optimum integration of HART field devices (HART transparency)
- Powerfail-proof storage of manufacturer and user data on the electronic modules
- All information/data required for operation/ startup run(s) through PROFIBUS, no service bus required
- Better diagnosis options and shorter commissioning times in comparison to conventional design
- Optimized for operation with PCS 7, open for operation with other process control systems
- No tools required to replace modules
- Hard-wired
- Spring-loaded or screw-type connection system for connection of sensors available
- Mechanically coded electronic modules



#### Application

The ET200iSP distributed I/O system has degree of protection IP30.

It is used wherever explosion protection for gases and dusts is required in compliance with CENELEC: II 2 G (1) GD EEx d e [ib/ia] IIC T4.

The ET200iSP system has been designed in accordance with the 94/9/EG guideline which must be complied with when new devices for potentially explosive atmospheres are introduced onto the European market.

The design of the system allows it to be used under high mechanical loads i.e. on oil platforms.

The system consists of terminal modules to which the corresponding functional units such as the power supply, interface module and electronic modules are connected.

This modular design ensures optimal adaptation to the plant-specific installation requirements in potentially explosive atmospheres. This ensures fast hot-swapping of individual functional units. In the case of a fault, only small parts of the plant are affected since only a few channels are processed in a module.

Using an ET200iSP station can save significant costs compared with a conventional design. Isolating stages and sub-distribution boards are no longer required and the cabling outlay is reduced since the station functions in a similar way to a local modular terminal. Commissioning and troubleshooting are simplified by the comprehensive diagnosis options.

In addition to the analog input modules and analog output modules with and without HART functionality, the existing product range of I/O modules also includes digital I/O modules whose functionalities are configurable.

The system has been designed to function optimally with SIMATIC S7 and SIMATIC PCS 7. It can also be used with other process control systems and SIMATIC S5 via an interface using a GSD file.

#### Design

A distributed I/O station (= Remote I/O) ET 200iSP comprises:

- A terminal module for the power supply unit as well as the associated power supply module to the EX d degree of protection (flameproof enclosure)
- A terminal module for the PROFIBUS interface as well as the associated IM 152 interface module  
In the case of a single PROFIBUS interface, another slot is available on the terminal module for an electronics module. If the PROFIBUS interface is implemented redundantly, a terminal module is available that can carry two IM 152 modules.
- Up to 32 terminal modules for the electronics modules as well as the digital and analog electronics modules that can be plugged into them. One terminal module can accept up to 2 electronics modules.
- One terminating module that is included in the scope of supply of the IM 152.

The stations are connected together on an S7-300 rail in accordance with the above list starting with the terminal module of the power supply unit, followed by the terminal module for the PROFIBUS interface followed by the required terminal modules for the electronics modules.

When the terminal modules are mounted, the wiring can be completed and tested without the need for electronics modules.

The appropriate electronics modules are plugged onto the terminal modules.

The inserted electronics modules are mechanically coded initially to prevent inadvertent swapping later.

No tools are required for mounting the terminal modules and electronics modules.

The maximum configuration is limited by the 32 electronics modules, which corresponds to a maximum station length of 107 cm.

The maximum possible number of modules can be limited as a result of the power consumption of the modules used. Up to 16 modules can be used without constraints, for a larger number, the planning rules must be taken into account.

PROFIBUS must be routed intrinsically safe into the hazardous area through a suitable fieldbus isolating transformer (RS 485IS coupler).

The 24 V connection to the power supply terminal is routed through EX e terminals. This connection is not permitted to be removed under Ex conditions. The feeder power supply must be installed in the safe area.

Installation in an EX e housing with at least degree of protection IP54 is a requirement for use in explosion-hazard areas.

#### Accessories:

The following accessories are available for the ET 200iSP:

- Pre-perforated DIN A4 labeling sheets for electronic modules in various colors, machine-printable
- Slot number plate for identification of terminal modules

# SIMATIC ET 200 distributed I/Os

## ET 200iSP

### Introduction

#### Function

##### Operating mode

Through PROFIBUS DP (up to 1.5 Mbit/s), a central PLC can access the electronic modules of the ET 200iSP station just like a central I/O module. Communication is handled by the master interface in the central PLC and the interface module of the ET 200iSP (= IM 152-1). The diagnostics integrated in the system reduce startup and debugging times.

The physical bus setup for devices in hazardous areas requires special protective measures. The method of the intrinsically safe PROFIBUS has been selected for ET 200iSP. This demands segmentation and power limiting on the bus (PROFIBUS RS 485-IS).

A commercially available "Fieldbus isolating transformer" (RS 485IS coupler) is used for this purpose. It can be installed in areas up to Zone 2. This converts the PROFIBUS DP to an intrinsically safe PROFIBUS RS 485-IS, which allows modules to be plugged and pulled – even under potentially explosive conditions.

##### Configuration

An ET 200iSP station can be connected to higher level PLCs as a DP V0 or DP V1 slave.

In an S7/PCS7 environment, configuration and parameterization of an ET 200iSP station is executed using SIMATIC STEP7 hardware manager. This defines the station design (which module where).

This software is opened by double-clicking one of the implemented modules/stations.

##### Software requirements

- SIMATIC STEP 7, Version 5.3 + SP1 incl. Hardware Support Package (HSP)
- SIMATIC PCS 7, Version V6.1
- For configuring HART field devices, the current version of the PDM configuring software is required.

##### Configuring in non-Siemens systems and older PCS 7/STEP 7 versions

In all other applications, the configuration of the station must be relayed to the PROFIBUS DP network through the GSD file.

In this case, parameterization is carried out through PDM, whereby a comparison of the configuration between PDM and GSD file is not possible. It is not possible to commission an ET 200iSP without the PDM configuration software.

The parameters of this module can then be defined in the PDM dialog fields, such as alarm limits for analog modules, sensor selection for digital modules, settings for the release of analog values and the output of HART commands for analog HART modules.

#### Technical specifications – general

Degree of protection	IP30
Ambient temperature	- 20 °C to + 70 °C
Vibration-proof	permanent: 0.5 g, intermittent: 1 g

##### Standards and approvals

• PROFIBUS	EN 50170, Volume 2
• EU directive	94/9/EC (ATEX 100a)
• CENELEC	II 2 G (1) GD EEx d e [ib/ia] IIC T4
• IEC	IEC 61131, Part 2
• CE	According to 89/336/EEC and 73/23/EEC

#### Overview



- The IM 152 interface module is plugged onto the corresponding terminal module TM-IM/EM (to be ordered separately). For redundant operation, two IM 152 are used. They are plugged onto the TM-IM/IM.
- The interface module IM 152 has the following properties:
  - Connects the ET 200iSP to PROFIBUS DP
  - Prepares data for the fitted electronic modules
  - The PROFIBUS address of ET 200iSP can be adjusted by switch
  - Slot for MMC
  - Firmware updating over PROFIBUS DP or MMC
- Shutting down the 24 V DC supply voltage at the terminal module TM-PS also shuts down the interface module IM 152.
- The maximum address size is 244 byte inputs and 244 byte outputs.

#### Technical specifications

IM152-1 interface module	6ES7 152-1AA00-0AB0
<b>Current consumption</b>	
• from supply voltage 1L+, max.	30 mA
• Power dissipation, typical	0.5 W
<b>Interfaces</b>	
• Physical interface, RS485	Yes; intrinsically safe
<b>Protocols</b>	
• PROFIBUS DP protocol	Yes
<b>PROFIBUS DP</b>	
• Transmission rate, max.	1.5 Mbit/s; 9.6; 19.2; 45.45; 93.75; 187.5; 500 kBaud
• SYNC capability	Yes
• FREEZE capability	Yes
• Direct data exchange (lateral communication)	Yes; slave to slave as publisher
<b>Clock synchronism</b>	
• Clock synchronous operation	No
<b>Status information/ interrupts/ diagnostics</b>	
Interrupts	
- Interrupts	Yes
- Acyclic function, interrupts	Yes
- Acyclic function, parameters	Yes
Diagnostics	
- Diagnostic functions	Yes
Diagnostic display LED	
- Bus fault BF (red)	Yes
- Group fault SF (red)	Yes
- Monitoring 24 V power supply ON (green)	Yes

IM152-1 interface module	6ES7 152-1AA00-0AB0
<b>Time stamp</b>	
• Description	per digital input per digital output entire module ET 200iSP
• Accuracy	20 ms
• Number of stamped digital inputs, max.	64; with precision class 20 ms
• Time of day format	RFC 1119 Internet (ISP)
• Time resolution	1 ms
• Time interval for transm. the message buffer if there is a mess.	1,000 ms
• Time stamp with signal change	in the case of a rising/falling edge as incoming outgoing event
<b>Potentials/ electrical isolation</b>	
• between supply load and electronic components	Yes
<b>Standards, approvals, certification</b>	
• CE mark	Yes
• Type of protection to EN 50020 (CENELEC)	I/2 G EEx ib IIC T4
• Type of protection to KEMA	04 ATEX 1243
<b>Dimensions and weight</b>	
• Weight, approx.	245 g
• Width	30 mm
• Height	129 mm
• Depth	136.5 mm
<b>General information</b>	
• Manufacturer's ID (VendorID)	8110H

Terminal modules	6ES7 193-7AA00-0AA0	6ES7 193-7AA10-0AA0	6ES7 193-7AB00-0AA0
<b>Standards, approvals, certification</b>			
• CE mark	No	No	No
• Type of protection to comply with EN 50020 (CENELEC)	No	No	No
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	04 ATEX 2242
<b>Dimensions and weight</b>			
• Weight, approx.	235 g	235 g	195 g
• Width	60 mm	60 mm	60 mm
• Height	190 mm	190 mm	190 mm
• Depth	52 mm	52 mm	52 mm

# SIMATIC ET 200 distributed I/Os

## ET 200iSP

### IM 152-1 interface module

Ordering data	Order No.	Order No.
<b>IM152 including the terminating module</b>		
• ET 200iSP-IM152-1	<b>6ES7 152-1AA00-0AB0</b>	
<b>Terminal modules for IM152</b>		
• TM-IM/EM60S A	<b>6ES7 193-7AA00-0AA0</b>	<b>6DL2 804-0AE30</b>
• TM-IM/EM60C A	<b>6ES7 193-7AA10-0AA0</b>	
• TM-IM/IM	<b>6ES7 193-7AB00-0AA0</b>	<b>6DL2 804-0AE50</b>
<b>Accessories</b>		
<b>ET 200iSP product manual</b>		
• German	<b>6ES7 152-1AA00-8AA0</b>	
• English	<b>6ES7 152-1AA00-8BA0</b>	
<b>Plug connector</b> A	<b>6ES7 972-0DA60-0XA0</b>	
PROFIBUS connector with active terminating resistor For RS 485-IS circuit; 1.5 Mbit/s		
<b>RS 485-IS segment</b>	<b>6ES7 972-0AC80-0XA0</b>	
Isolating transition for coupling PROFIBUS DP to PROFIBUS RS 485-IS		
<b>Sheet of labels</b>		
DIN A4, perforated, consisting of 10 sheets each with 30 labels for electronic modules and 20 labels for IM 152		
• Petrol	<b>6ES7 193-7BH00-0AA0</b>	
• Red	<b>6ES7 193-7BD00-0AA0</b>	
• Yellow	<b>6ES7 193-7BB00-0AA0</b>	
• Light beige	<b>6ES7 193-7BA00-0AA0</b>	
<b>Identification labels, inscribed</b>		
Order quantity 1 set of 200 of each color for slot numbering		
• 10 x Slot 1 to 2	<b>8WA8 861-0AB</b>	
• 5 x Slot 1 to 40	<b>8WA8 861-0AC</b>	
• 1 x Slot 1 to 64 2 x Slot 1 to 68	<b>8WA8 861-0DA</b>	
<b>Identification labels, blank</b>	<b>8WA8 848-2AY</b>	
Order quantity 1 set of 200 of each color for slot numbering		
<b>Standard rails S7-300</b>		
Standard rail 585 mm	<b>6ES7 390-1AF85-0AA0</b>	
Standard rail 885 mm	<b>6ES7 390-1AJ85-0AA0</b>	
<b>Stainless steel housing IP66 for hazardous Zone 1 with safety class EEx e</b>		
<u>Empty housing with no modules installed, for use in gaseous atmospheres, IP65 (IP54 if a breather gland is used)</u>		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs	<b>6DL2 804-0AD30</b>	<b>6DL2 804-1AD30</b>
• with 5 rows of cable glands M16 (66 items)	<b>6DL2 804-0AD50</b>	<b>6DL2 804-1AD50</b>
<b>Accessories (continued)</b>		
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		<b>6DL2 804-0AE30</b>
• with 5 rows of cable glands M16 (111 items)		<b>6DL2 804-0AE50</b>
<u>Empty housing with no modules installed, for use in dusty atmospheres, IP65</u>		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs		<b>6DL2 804-0DD30</b>
• with 5 rows of cable glands M16 (66 items)		<b>6DL2 804-0DD50</b>
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		<b>6DL2 804-0DE30</b>
• with 5 rows of cable glands M16 (111 items)		<b>6DL2 804-0DE50</b>
<u>Housing with ET 200iSP modules installed, for use in gaseous atmospheres, IP65 (IP54 when using a breather gland) <sup>1)</sup></u>		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs		<b>6DL2 804-1AD30</b>
• with 5 rows of cable glands M16 (66 items)		<b>6DL2 804-1AD50</b>
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		<b>6DL2 804-1AE30</b>
• with 5 rows of cable glands M16 (111 items)		<b>6DL2 804-1AE50</b>
<u>Housing with modules installed, for use in dusty atmospheres, IP65 <sup>1)</sup></u>		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs		<b>6DL2 804-1DD30</b>
• with 5 rows of cable glands M16 (66 items)		<b>6DL2 804-1DD50</b>
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		<b>6DL2 804-1DE30</b>
• with 5 rows of cable glands M16 (111 items)		<b>6DL2 804-1DE50</b>

1) The ET 200iSP components must be ordered separately  
A) Subject to export regulations: AL: N and ECCN: EAR99H

#### Overview



- The electronic modules are plugged into the associated terminal modules that must be ordered separately (with screw-type or spring-loaded terminals).
- When plugged in, the modules are automatically uniquely coded mechanically.
- Modules can be replaced under potentially explosive conditions during runtime.

#### Technical specifications

<b>Digital input module</b>	<b>6ES7 131-7RF00-0AB0</b>
<b>Digital inputs</b>	
• Number of NAMUR inputs	8
Length of cable	
- Length of cable shielded, max	200 m
Input delay (at rated value of the input voltage)	
• For standard inputs	
- at 0 to 1, min.	2.8 µs
- at 0 to 1, max.	3.5 µs
- at 1 to 0, min.	2.8 ms
- at 1 to 0, max.	3.5 µs
<b>Sensor</b>	
• Number of sensors that can be connected, max.	8
Connectable encoders	
- NAMUR sensor	Yes
NAMUR sensor	
- Input current, for 0 signal, max.	1.2 mA
- Input current, for 1 signal, min.	2.1 mA
<b>Integral functions</b>	
• Frequency sensor	Yes
• Frequency measurement	Yes; (gate time) 50ms; 200ms; 1s
• Number of frequency sensors	2
<b>Counter</b>	
• Number of counter inputs	2; normal and periodic counting function
• Input frequency, max.	5 kHz; for cable length 20 m 5 kHz; for cable length 100 m 1 kHz; for cable length 200 m 500 Hz
<b>Status information/ interrupts/ diagnostics</b>	
Interrupts	
- Diagnostic interrupt	Yes; with parameter assignment
- Process interrupt	No
Diagnostics	
- Diagnostic functions	Yes
- Diagnostic information can be read out	Yes
- Short circuit	Yes; R load < 150 Ohms with NAMUR encoder/encoder and NAMUR changeover contact /encoder to DIN 19234
Diagnostic display LED	
- Group fault SF (red)	Yes
<b>Galvanic isolation</b>	
Digital input functions	
- between the channels	No
- between the channels and the backplane bus	Yes
<b>Permissible potential difference</b>	
• between different circuits	60 V DC, 30 V AC
<b>Standards, approvals, certification</b>	
• CE mark	Yes
• Type of protection to EN 50020 (CENELEC)	II2 G (1) GD EEx ib[ia] IIC T4
• Type of protection to KEMA	04 ATEX 1248
<b>Dimensions and weight</b>	
• Weight, approx.	255 g
• Width	30 mm
• Height	129 mm
• Depth	136.5 mm

# SIMATIC ET 200 distributed I/Os

## ET 200iSP

### ET 200iSP digital electronics modules and terminal modules

#### Technical specifications (continued)

Digital output module	6ES7 132-7RD00-0AB0	6ES7 132-7RD10-0AB0	6ES7 132-7RD20-0AB0
<b>Current consumption</b>			
• from load voltage L+ (no load), • Power dissipation, typical	max. 340 mA 2.5 W	max. 300 mA 2.1 W	max. 400 mA 2.8 W
<b>Digital outputs</b>			
• Number of digital outputs • Length of cable shielded, max. • Length of cable unshielded, max. • Short-circuit protect. of the output • Open-circuit voltage U <sub>ao</sub> (DC) • Internal resistance R <sub>i</sub>	4 200 m 200 m Yes 23.1 V 275 Ω	4 200 m 200 m Yes 17.4 V 150 Ω	4 200 m 200 m Yes 17.4 V 150 Ω
Trend points E			
- Voltage U <sub>e</sub> (DC) - Current I <sub>e</sub>	17.1 V 20 mA	13.2 V 27 mA; 54 mA with outputs switched in parallel	11 V 40 mA; 80 mA with outputs switched in parallel
Output delay at resistive load			
- "0" after "1", max. - "1" after "0", max.	2 ms 1.5 ms	2 ms 1.5 ms	2 ms 1.5 ms
Parallel switching of 2 outputs - to increase power	Yes	Yes	Yes
Switching frequency			
- at resistive load, max. - at inductive load, max.	100 Hz 2 Hz	100 Hz 2 Hz	100 Hz 2 Hz
<b>Status inform./ interrupts/ diagn.</b>			
Interrupts			
- Interrupts - Diagnostic interrupt	No Yes; with parameter assignment	No Yes; with parameter assignment	No Yes; with parameter assignment
Diagnostics			
- Diagn. inform. can be read out - Wire break - Short circuit	Yes Yes; R <sub>1</sub> > 10 kOhms I < 100 uA Yes; R < 800 Ohms (one output), R < 40 Ohms (outputs switched parallel)	Yes Yes; R <sub>1</sub> > 10 kOhms I < 100 uA Yes; R < 800 Ohms (one output), R < 40 Ohms (outputs switched parallel)	Yes Yes; R <sub>1</sub> > 10 kOhms I < 100 uA Yes; R < 800 Ohms (one output), R < 40 Ohms (outputs switched parallel)
Diagnostic display LED			
- Group fault SF (red) - Status display digital out. (green)	Yes Yes; per channel	Yes Yes; per channel	Yes Yes; per channel
<b>Galvanic isolation</b>			
Digital output functions			
- between the channels - between the channels and the backplane bus - between the channels and the load voltage L+	No Yes Yes	No Yes Yes	No Yes Yes
<b>Permissible potential difference</b>			
• between different circuits	60 V DC, 30 V AC	60 V DC, 30 V AC	60 V DC, 30 V AC
<b>Standards, approvals, certific.</b>			
• CE mark • Type of protection to EN 50020 (CENELEC) • Type of protection to KEMA	Yes II2 G (1) GD EEx ib[ia] IIC T4 04 ATEX 1249	Yes II2 G (1) GD EEx ib[ia] IIC T4 04 ATEX 1249	Yes II2 G (1) GD EEx ib[ia] IIC T4 04 ATEX 1249
<b>Dimensions and weight</b>			
• Weight, approx. • Width / Height / Depth in mm	255 g 30 / 129 / 136.5	255 g 30 / 129 / 136.5	255 g 30 / 129 / 136.5
<b>Terminal modules</b>	<b>6ES7 193-7CA00-0AA0</b>	<b>6ES7 193-7CA10-0AA0</b>	
<b>Standards, approvals, certific.</b>			
• CE mark • Type of protection to comply with EN 50020 (CENELEC) • Type of protection to KEMA	No No 04 ATEX 2242	No No 04 ATEX 2242	
<b>Dimensions and weight</b>			
• Weight, approx. • Width / Height / Depth in mm	275 g 60 / 190 / 52	275 g 60 / 190 / 52	

Ordering data	Order No.	Order No.
<b>Digital input module 8 DI NAMUR</b> 8 x DI Namur	A 6ES7 131-7RF00-0AB0	
<b>Digital output module 4 DO 23.1 V DC/20 mA</b>	A 6ES7 132-7RD00-0AB0	
<b>Digital output module 4 DO 17.4 V DC/27 mA</b>	A 6ES7 132-7RD10-0AB0	
<b>Digital output module 4 DO 17.4 V DC/40 mA</b> 4 x DO	6ES7 132-7RD20-0AB0	
<b>TM-EM/EM60S</b> Terminal module E60S (screw-type terminals)	A 6ES7 193-7CA00-0AA0	
<b>TM-EM/EM60C</b> Terminal module E60C (spring-loaded terminals)	A 6ES7 193-7CA10-0AA0	
<b>Accessories</b>		
<b>ET 200iSP product manual</b>		
• German	6ES7 152-1AA00-8AA0	
• English	6ES7 152-1AA00-8BA0	
<b>Plug connector</b> PROFIBUS connector with active terminating resistor For RS 485-IS circuit; 1.5 Mbit/s	A 6ES7 972-0DA60-0XA0	
<b>RS 485-IS segment</b> Isolating transition for coupling PROFIBUS DP to PROFIBUS RS 485-IS	6ES7 972-0AC80-0XA0	
<b>Sheet of labels</b> DIN A4, perforated, consisting of 10 sheets each with 30 labels for electronic modules and 20 labels for IM 152		
• Petrol	6ES7 193-7BH00-0AA0	
• Red	6ES7 193-7BD00-0AA0	
• Yellow	6ES7 193-7BB00-0AA0	
• Light beige	6ES7 193-7BA00-0AA0	
<b>Identification labels, inscribed</b> Order quantity 1 set of 200 of each color for slot numbering		
• 10 x Slot 1 to 2	8WA8 861-0AB	
• 5 x Slot 1 to 40	8WA8 861-0AC	
<b>Identification labels, blank</b> Order quantity 1 set of 200 of each color for slot numbering	8WA8 848-2AY	
<b>Standard rails S7-300</b> Standard rail 585 mm Standard rail 885 mm	6ES7 390-1AF85-0AA0 6ES7 390-1AJ85-0AA0	
<b>Stainless steel housing IP66 for hazardous Zone 1 with safety class EEx e</b> <u>Empty housing with no modules installed, for use in gaseous atmospheres, IP65 (IP54 if a breather gland is used)</u> Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs	6DL2 804-0AD30	
• with 5 rows of cable glands M16 (66 items)	6DL2 804-0AD50	
<b>Accessories</b> (continued)		
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		6DL2 804-0AE30
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		6DL2 804-0AE50
• with 5 rows of cable glands M16 (111 items)		
<u>Empty housing with no modules installed, for use in dusty atmospheres, IP65</u>		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		6DL2 804-0DD30
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs		6DL2 804-0DD50
• with 5 rows of cable glands M16 (66 items)		
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		6DL2 804-0DE30
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		6DL2 804-0DE50
• with 5 rows of cable glands M16 (111 items)		
<u>Housing with ET 200iSP modules installed, for use in gaseous atmospheres, IP65 (IP54 when using a breather gland) <sup>1)</sup></u>		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		6DL2 804-1AD30
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs		6DL2 804-1AD50
• with 5 rows of cable glands M16 (66 items)		
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		6DL2 804-1AE30
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		6DL2 804-1AE50
• with 5 rows of cable glands M16 (111 items)		
<u>Housing with modules installed, for use in dusty atmospheres, IP65 <sup>1)</sup></u>		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		6DL2 804-1DD30
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs		6DL2 804-1DD50
• with 5 rows of cable glands M16 (66 items)		
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		6DL2 804-1DE30
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		6DL2 804-1DE50
• with 5 rows of cable glands M16 (111 items)		

1) The ET 200iSP components must be ordered separately  
A) Subject to export regulations: AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/Os

## ET 200iSP

### ET 200iSP analog electronics modules and terminal modules

#### Overview



- The electronic modules are plugged into the associated terminal modules that must be ordered separately (with screw-type or spring-loaded terminals).
- When plugged in, the modules are automatically uniquely coded mechanically.
- Modules can be replaced under potentially explosive conditions during runtime.



#### Technical specifications

Analog input modules	6ES7 134-7SD00-0AB0	6ES7 134-7SD50-0AB0	6ES7 134-7TD00-0AB0	6ES7 134-7TD50-0AB0
<b>Voltages and currents</b>				
Power supply of measuring transducers				
- Short-circuit proof			Yes	
- Supply current, max.			23 mA; per channel	
<b>Current consumption</b>				
• from supply voltage L+, max.	30 mA	22 mA	320 mA	30 mA
• Power dissipation, typical	0.4 W	0.4 W	2.7 W	0.4 W
<b>Analog inputs</b>				
• Number of analog inputs	4	4	4	4
• Length of cable shielded, max	50 m	200 m	200 m	200 m
• Perm. input volt. for the current input (destr. lim.), max.			90 mA	50 mA
• Technical unit for temperature measurement, adjustable	Yes	Yes	Yes	Yes
Input ranges (rated values), voltages				
- Voltage	Yes			
- -80 mV to +80 mV	Yes			
- Input resistance (-80 mV to +80 mV)	1,000 kΩ			
Input ranges (rated values), currents				
- Current			Yes	Yes
- 4 to 20 mA			Yes	Yes; min. 295 Ohms
Input ranges (rated values), thermocouples				
- Thermocouple	Yes			
- Type B	Yes			
- Input resistance (type B)	1,000 kΩ			
- Type C	Yes			
- Input resistance (type C)	1,000 kΩ			
- Type E	Yes			
- Input resistance (type E)	1,000 kΩ			
- Type J	Yes			
- Input resistance (type J)	1,000 kΩ			
- Type K	Yes			
- Input resistance (type K)	1,000 kΩ			
- Type L	Yes			
- Input resistance (type L)	1,000 kΩ			
- Type N	Yes			
- Input resistance (type N)	1,000 kΩ			
- Type R	Yes			
- Input resistance (type R)	1,000 kΩ			
- Type S	Yes			
- Input resistance (type S)	1,000 kΩ			
- Type T	Yes			
- Input resistance (type T)	1,000 kΩ			
- Type U	Yes			
- Input resistance (type U)	1,000 kΩ			
Input ranges (rated values), resistances				
- Resistance		Yes		
- Input resistance (0 to 600 ohms)		0.6 kΩ		
Input ranges (rated values), resistance thermometer				
- Resistance thermometer		Yes		
- Ni 100		Yes		
- Input resistance (Ni 100)		2,000 kΩ		
- Pt 100		Yes		
- Input resistance (Pt 100)		2,000 kΩ		

# SIMATIC ET 200 distributed I/Os

## ET 200iSP

### ET 200iSP analog electronics modules and terminal modules

#### Technical specifications (continued)

Analog input modules	6ES7 134-7SD00-0AB0	6ES7 134-7SD50-0AB0	6ES7 134-7TD00-0AB0	6ES7 134-7TD50-0AB0
Characteristic curve linearization - parameterizable - for thermocouple - for resistance thermometer	Yes Yes	Yes Yes		
Temperature compensation - external temperature compensation with compensating box possible - internal temperature compensation possible	Yes; over temperature value, measured on an analog module of a similar ET 200iSP station Yes; using the TC sensor module delivered			
<b>Analog value formation</b> • Measuring principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)
Integration and conversion time/triggering per channel - with over-range (bits incl. sign), max - Integration time parameterizable - basic conversion time including integration time, ms - additional conversion time for wire-break monitoring - noise suppression f1 in Hz	16 bit Yes 80 ms at 50 Hz; 66 ms at 60 Hz 5 50 Hz and 60 Hz	16 bit Yes 80 ms at 50 Hz; 66 ms at 60 Hz 5 50 and 60 Hz	13 bit No 50 and 60 Hz	12 bit; + sign Yes 30 50 and 60 Hz
Smoothing of measured values - Parameterizable - None - Weak - Medium - Strong	Yes; in 4 steps Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; in 4 steps Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; in 4 steps Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; in 4 steps Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time
<b>Sensor</b> Sensing element connection - for current measurement, as 2-wire measuring transducer - for current measurement, as 4-wire measuring transducer - for resistance measurement, with 2-wire connection - for resistance measurement, with 3-wire connection - for resistance measurement, with 4-wire connection - Burden of the 2-wire measuring transformer, max.		Yes Yes Yes	Yes 750 Ω	Yes
<b>Error/accuracies</b> • Linearity error (with respect to input range) • Temperature error (with respect to input range) • Crosstalk between the outputs, min • Accuracy in steady-state condition to 25 °C (with respect to input range)	+/- 0.015 % +/- 0.02 %/K -50 dB +/- 0.01 %	+/- 0.015 % +/- 0.02 %/K -50 dB +/- 0.01 %	+/- 0.015 % +/- 0.005 %/K -50 dB +/- 0.01 %	+/- 0.015 % +/- 0.005 %/K -50 dB +/- 0.01 %
Operational limit in the entire temperature range - relative to the input range, voltage - relative to the input range, current - with respect to input range, Wiresistance thermometer	+/- 0.15 %	+/- 0.15 %	+/- 0.15 %	+/- 0.15 %

#### Technical specifications (continued)

Analog input modules	6ES7 134-7SD00-0AB0	6ES7 134-7SD50-0AB0	6ES7 134-7TD00-0AB0	6ES7 134-7TD50-0AB0
<b>Basic error limit</b> (operational limit at 25 °C) - relative to the input range, voltage - relative to the input range, current - with respect to input range, resistance thermometer	+/- 0.1 %	+/- 0.1 %	+/- 0.1 %	+/- 0.1 %
<b>Interference voltage suppression</b> for $f = n \times (f_l \pm 1 \%)$ - Series-mode interference (peak value of interference < rated val - Common-mode interference, min	70 dB 90 dB	70 dB 90 dB	70 dB	70 dB
<b>Status information/ interrupts/                      diagnostics</b> Interrupts - Diagnostic interrupt - Limit value interrupt Diagnostics - Diagnostic information can be read out - Wire break - Short circuit Diagnostic display LED - Group fault SF (red)	Yes; can be assigned parameters Yes; can be assigned parameters Yes Yes Yes	Yes; can be assigned parameters Yes; can be assigned parameters Yes Yes Yes	Yes; can be assigned parameters Yes; can be assigned parameters Yes Yes Yes	Yes; can be assigned parameters Yes; can be assigned parameters Yes Yes Yes
<b>Galvanic isolation</b> Analog inputs - between the channels - between the channels and the backplane bus	Yes; functional Yes	Yes Yes	No Yes	No Yes
<b>Standards, approvals,                      certification</b> • CE mark • Type of protection to EN 50020 (CENELEC) • Type of protection to KEMA	Yes II2 G (1) GD EEx ib[ia] IIC T4 04 ATEX 1246	Yes II2 G (1) GD Eex ib[ia] IIC T4 04 ATEX 1247	Yes II2 G (1) GD EEx ib[ia] IIC T4 04 ATEX 1244	Yes II2 G (1) GD EEx ib[ia] IIC T4 04 ATEX 1245
<b>Dimensions and weight</b> • Weight, approx. • Width • Height • Depth	230 g 30 mm 129 mm 136.5 mm	230 g 30 mm 129 mm 136.5 mm	230 g 30 mm 129 mm 136.5 mm	230 g 30 mm 129 mm 136.5 mm

# SIMATIC ET 200 distributed I/Os

## ET 200iSP

### ET 200iSP analog electronics modules and terminal modules

#### Technical specifications (continued)

Analog output modules	6ES7 135-7TD00-0AB0
<b>Current consumption</b>	
• from load voltage 1L+, max	330 mA
• Power dissipation, max.	2.7 W
<b>Analog outputs</b>	
• Number of analog outputs	4
• Length of cable shielded, max	200 m
Output ranges, current	
- 4 to 20 mA	Yes
Actuator connection	
- for current output 2-wire connection	Yes
Burden resistance (in the nominal output range)	
- at current outputs, max.	750 Ω
<b>Analog value formation</b>	
Integration and conversion time/triggering per channel	
- with over-range (bits incl. sign), max.	14 bit
Settling time	
- for resistive load	4 ms
- for capacitive load	40 ms
- for inductive load	40 ms
<b>Error/accuracies</b>	
• linearity error (with respect to output range)	+/- 0.015 %
• temperature error (with respect to output range)	+/- 0.005 %/K
• Crosstalk between the outputs, min	-50 dB
• Repetition accuracy in steady-state condition at 25 °C (with respect to output range)	+/- 0.01 %
Operational limit over entire temperature range	
• with respect to output range, current	+/- 0.15 %
Basic error limit (Operational limit at 25 °C)	
• with respect to output range, current	+/- 0.1 %

Analog output modules	6ES7 135-7TD00-0AB0
<b>Status information/ interrupts/ diagnostics</b>	
• Applying substitute values	Yes
Interrupts	
- Diagnostic interrupt	Yes
Diagnostics	
- Diagnostic information can be read out	Yes
- Wire break	Yes
- Short circuit	Yes
Diagnostic display LED	
- Group fault SF (red)	Yes
<b>Galvanic isolation</b>	
Analog output functions	
- between the channels	No
- between the channels and the backplane bus	Yes
<b>Standards, approvals, certificates</b>	
• Type of protection to KEMA	04 ATEX 1250
<b>Dimensions and weight</b>	
• Weight, approx.	265 g
• Width	30 mm
• Height	129 mm
• Depth	136.5 mm

Terminal modules	6ES7 193-7CA00-0AA0	6ES7 193-7CA10-0AA0
<b>Standards, approvals, certification</b>		
• CE mark	No	No
• Type of protection to comply with EN 50020 (CENELEC)	No	No
• Test number KEMA	04 ATEX 2242	04 ATEX 2242
<b>Dimensions and weight</b>		
• Weight, approx.	275 g	275 g
• Width	60 mm	60 mm
• Height	190 mm	190 mm
• Depth	52 mm	52 mm

Ordering data	Order No.	Order No.
<b>Analog input modules</b>		
<b>4 AI   2WIRE HART</b>	A <b>6ES7 134-7TD00-0AB0</b>	
<b>4 AI   4WIRE HART</b>	<b>6ES7 134-7TD50-0AB0</b>	
<b>4 AI RTD</b>	<b>6ES7 134-7SD50-0AB0</b>	
<b>4 AI TC</b>	<b>6ES7 134-7SD00-0AB0</b>	
<b>Analog output modules</b>		
<b>4 AO   HART</b>	A <b>6ES7 135-7TD00-0AB0</b>	
<b>Terminal modules</b>		
<b>TM-EM/EM60S</b> Terminal module E60S (screw-type terminals)	A <b>6ES7 193-7CA00-0AA0</b>	
<b>TM-EM/EM60C</b> Terminal module E60C (spring-loaded terminals)	A <b>6ES7 193-7CA10-0AA0</b>	
<b>Accessories</b>		
<b>ET 200iSP product manual</b>		
• German	<b>6ES7 152-1AA00-8AA0</b>	
• English	<b>6ES7 152-1AA00-8BA0</b>	
<b>Plug connector</b> PROFIBUS connector with active A terminating resistor For RS 485-IS circuit; 1.5 Mbit/s	<b>6ES7 972-0DA60-0XA0</b>	
<b>RS 485-IS segment</b> Isolating transition for coupling PROFIBUS DP to PROFIBUS RS 485-IS	<b>6ES7 972-0AC80-0XA0</b>	
<b>Sheet of labels</b> DIN A4, perforated, consisting of 10 sheets each with 30 labels for electronic modules and 20 labels for IM 152		
• Petrol	<b>6ES7 193-7BH00-0AA0</b>	
• Red	<b>6ES7 193-7BD00-0AA0</b>	
• Yellow	<b>6ES7 193-7BB00-0AA0</b>	
• Light beige	<b>6ES7 193-7BA00-0AA0</b>	
<b>Identification labels, inscribed</b> Order quantity 1 set of 200 of each color for slot numbering		
• 10 x Slot 1 to 2	<b>8WA8 861-0AB</b>	
• 5 x Slot 1 to 40	<b>8WA8 861-0AC</b>	
<b>Identification labels, blank</b> Order quantity 1 set of 200 of each color for slot numbering	<b>8WA8 848-2AY</b>	
<b>Standard rails S7-300</b>		
Standard rail 585 mm	<b>6ES7 390-1AF85-0AA0</b>	
Standard rail 885 mm	<b>6ES7 390-1AJ85-0AA0</b>	
<b>Stainless steel housing IP66 for hazardous Zone 1 with safety class EEx e</b> <u>Empty housing with no modules installed, for use in gaseous atmospheres, IP65 (IP54 if a breather gland is used)</u> Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs	<b>6DL2 804-0AD30</b>	
• with 5 rows of cable glands M16 (66 items)	<b>6DL2 804-0AD50</b>	
<b>Accessories (continued)</b>		
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		<b>6DL2 804-0AE30</b>
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (111 items)		<b>6DL2 804-0AE50</b>
<u>Empty housing with no modules installed, for use in dusty atmo- spheres, IP65</u>		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		<b>6DL2 804-0DD30</b>
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (66 items)		<b>6DL2 804-0DD50</b>
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		<b>6DL2 804-0DE30</b>
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (111 items)		<b>6DL2 804-0DE50</b>
<u>Housing with ET 200iSP modules installed, for use in gaseous atmospheres, IP65 (IP54 when using a breather gland) 1)</u>		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		<b>6DL2 804-1AD30</b>
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (66 items)		<b>6DL2 804-1AD50</b>
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		<b>6DL2 804-1AE30</b>
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (111 items)		<b>6DL2 804-1AE50</b>
<u>Housing with modules installed, for use in dusty atmospheres, IP65 1)</u>		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		<b>6DL2 804-1DD30</b>
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (66 items)		<b>6DL2 804-1DD50</b>
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		<b>6DL2 804-1DE30</b>
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (111 items)		<b>6DL2 804-1DE50</b>

1) The ET 200iSP components must be ordered separately  
A) Subject to export regulations: AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/Os

## ET 200iSP

### ET 200iSP reserve modules and terminal modules

#### Overview

- The reserve module is plugged onto the relevant terminal module (to be ordered separately; screw-type or spring-loaded connection).
- Modules can be replaced under potentially explosive conditions during runtime.

#### Technical specifications

<b>Reserve module</b>	<b>6ES7 138-7AA00-0AA0</b>	
<b>Dimensions and weight</b>		
• Width	30 mm	
• Height	129 mm	
• Depth	136.5 mm	
• Weight, approx.	180 g	
<b>Module-specific data</b>		
Type of protection		
• CENELEC	II2 (1) G EEx ib IIC T4; T <sub>U</sub> = -20 °C to +70 °C (T <sub>U</sub> = +50 °C for all other mounting positions)	
<b>Voltages, currents and potentials</b>		
• Power losses for module	Max. 0.03 W	
Status, interrupts, diagnostics		
• Status display	No	
• Diagnostic function	No	
<b>Safety-related data</b>		
See EU type test certificate	KEMA 04ATEX1251	
<b>Terminal modules</b>	<b>6ES7 193-7CA00-0AA0</b>	<b>6ES7 193-7CA10-0AA0</b>
<b>Standards, approvals, certification</b>		
• CE mark	No	No
• Type of protection to comply with EN 50020 (CENELEC)	No	No
• Test number KEMA	04 ATEX 2242	04 ATEX 2242
<b>Dimensions and weight</b>		
• Width	60 mm	60 mm
• Height	190 mm	190 mm
• Depth	52 mm	52 mm
• Weight, approx.	275 g	275 g

Ordering data	Order No.	Order No.
<b>Reservemodul</b>	A <b>6ES7 138-7AA00-0AA0</b>	
<b>Terminal modules</b>		
<b>TM-EM/EM60S</b> Terminal module E60S (screw-type terminals)	A <b>6ES7 193-7CA00-0AA0</b>	
<b>TM-EM/EM60C</b> Terminal module E60C (spring-loaded terminals)	A <b>6ES7 193-7CA10-0AA0</b>	
<b>Accessories</b>		
<b>ET 200iSP product manual</b>		
• German	<b>6ES7 152-1AA00-8AA0</b>	
• English	<b>6ES7 152-1AA00-8BA0</b>	
<b>Plug connector</b> PROFIBUS connector with active terminating resistor For RS 485-IS circuit; 1.5 Mbit/s	A <b>6ES7 972-0DA60-0XA0</b>	
<b>RS 485-IS segment</b> Isolating transition for coupling PROFIBUS DP to PROFIBUS RS 485-IS	<b>6ES7 972-0AC80-0XA0</b>	
<b>Sheet of labels</b> DIN A4, perforated, consisting of 10 sheets each with 30 labels for electronic modules and 20 labels for IM 152		
• Petrol	<b>6ES7 193-7BH00-0AA0</b>	
• Red	<b>6ES7 193-7BD00-0AA0</b>	
• Yellow	<b>6ES7 193-7BB00-0AA0</b>	
• Light beige	<b>6ES7 193-7BA00-0AA0</b>	
<b>Identification labels, inscribed</b> Order quantity 1 set of 200 of each color for slot numbering		
• 10 x Slot 1 to 2	<b>8WA8 861-0AB</b>	
• 5 x Slot 1 to 40	<b>8WA8 861-0AC</b>	
<b>Identification labels, blank</b> Order quantity 1 set of 200 of each color for slot numbering	<b>8WA8 848-2AY</b>	
<b>Standard rails S7-300</b>		
Standard rail 585 mm	<b>6ES7 390-1AF85-0AA0</b>	
Standard rail 885 mm	<b>6ES7 390-1AJ85-0AA0</b>	
<b>Stainless steel housing IP66 for hazardous Zone 1 with safety class EEx e</b> Empty housing with no modules installed, for use in gaseous atmospheres, IP65 (IP54 if a breather gland is used) Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs	<b>6DL2 804-0AD30</b>	
• with 5 rows of cable glands M16 (66 items)	<b>6DL2 804-0AD50</b>	
<b>Accessories (continued)</b>		
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		<b>6DL2 804-0AE30</b>
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (111 items)		<b>6DL2 804-0AE50</b>
Empty housing with no modules installed, for use in dusty atmospheres, IP65		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		<b>6DL2 804-0DD30</b>
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (66 items)		<b>6DL2 804-0DD50</b>
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		<b>6DL2 804-0DE30</b>
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (111 items)		<b>6DL2 804-0DE50</b>
Housing with ET 200iSP modules installed, for use in gaseous atmospheres, IP65 (IP54 when using a breather gland) <sup>1)</sup>		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		<b>6DL2 804-1AD30</b>
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (66 items)		<b>6DL2 804-1AD50</b>
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		<b>6DL2 804-1AE30</b>
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (111 items)		<b>6DL2 804-1AE50</b>
Housing with modules installed, for use in dusty atmospheres, IP65 <sup>1)</sup>		
Wall housing 650 x 450 x 230 for the installation of up to 15 ET 200iSP modules		<b>6DL2 804-1DD30</b>
• with 3 rows of cable glands M16 (41 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (66 items)		<b>6DL2 804-1DD50</b>
Wall housing 950 x 450 x 230 for the installation of up to 25 ET 200iSP modules		<b>6DL2 804-1DE30</b>
• with 3 rows of cable glands M16 (68 items) and 2 rows of cover plugs		
• with 5 rows of cable glands M16 (111 items)		<b>6DL2 804-1DE50</b>

1) The ET 200iSP components must be ordered separately  
A) Subject to export regulations: AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/Os

## ET 200iSP

### ET 200iSP power supply unit

#### Overview



The power supply (PS) is plugged into the associated terminal module TM-PS-A or TM-PS-B (with redundancy; to be ordered separately).

The power supply unit fulfills the following functions:

- It provides reliable isolated power supply for the ET 200iSP with the necessary operating voltages for:
  - Logic (through the backplane bus)
  - PROFIBUS DP interface of IM 152-1
  - Powerbus (for supplying the electronic modules)
- Takes over the safety limit of the output voltage
- Has an explosion-proof metal enclosure (explosion protection EEx d)
- Can be redundantly configured

#### Technical specifications

<b>Power Supply (PS)</b>	<b>6ES7 138-7EA00-0AA0</b>	
<b>Voltages and currents</b>		
• Line supply/voltage failure buffering, min.	0.25 ms; for power bus and backplane bus; (15 ms for IM 152)	
Load voltage L+		
- Rated value (DC)	24 V	
- Reverse polarity protection	Yes	
<b>Current consumption</b>		
• from supply voltage L+, max.	4 mA	
• Power dissipation, typical	20 W	
<b>Ex(i)-modules</b>		
Maximum values of the input circuits (per channel)		
- Um (fault voltage), max	60 V; dc	
<b>Status information/ interrupts/ diagnostics</b>		
• Status display	Yes	
Interrupts	No	
Diagnostics		
• Diagnostic information can be read out	Yes; over IM 152	
Diagnostic display LED		
• Group fault SF (red)	No	
<b>Isolation</b>		
tested		
• across all secondary voltages	500 V AC	
• across supply voltage and all secondary voltages	1500 V AC	
<b>Galvanic isolation</b>		
• between supply load and electronic components	Yes	
<b>Standards, approvals, certific.</b>		
• CE mark	Yes	
• Type of protection according to EN 50020 (CENELEC)	II2 G EEx de [ib] IIC T4	
• Type of protection to KEMA	04 ATEX 2263	
<b>Dimensions and weight</b>		
• Weight, approx.	2,700 g	
• Width	60 mm	
• Height	190 mm	
• Depth	136.5 mm	
<b>Terminal modules</b>	<b>6ES7 193-7DA00-0AA0</b>	<b>6ES7 193-7DB00-0AA0</b>
<b>Standards, approvals, certific.</b>		
• CE mark	Yes	Yes
• Type of protection according to EN 50020 (CENELEC)	II2 G (1) GD EEx de[ia/ib] IIC T4	II2 G (1) GD EEx de[ia/ib] IIC T4
• Type of protection to KEMA	04 ATEX 2242	04 ATEX 2242
<b>Dimensions and weight</b>		
• Weight, approx.	235 g	235 g
• Width	60 mm	60 mm
• Height	190 mm	90 mm
• Depth	52 mm	52 mm

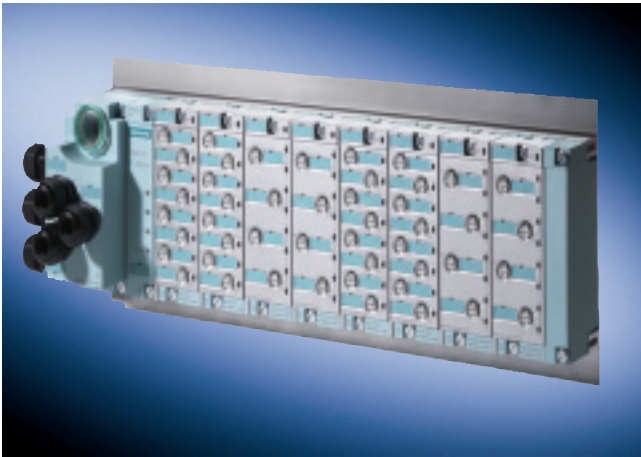
#### Ordering data

#### Order No.

<b>Power supply module PS</b>	<b>6ES7 138-7EA00-0AA0</b>
<b>Terminal module TM-PS-A standard</b>	<b>6ES7 193-7DA00-0AA0</b>
<b>Terminal module TM-PS-B for redundant operation</b>	<b>6ES7 193-7DB00-0AA0</b>



#### Overview



Distributed I/O station with degree of protection IP65/66/67 for application on the machine level without control cabinet

- Flexible fieldbus connection through interface modules for PROFIBUS DP and PROFINET (available soon)
- Modular design with up to 16 expansion modules for flexible adaptation to the automation task
- Comprehensive module range:
  - Digital and analog input and output modules
  - PROFIsafe modules (available soon)
  - Power modules for simple implementation of 24 V load groups
  - Motor starters up to 5.5 kW (available soon)
- Simple, quick assembly and high vibration strength due to rack
- Integration of safety technology with PROFIsafe
- High plant availability thanks to permanent wiring and the ability to replace electronic modules during operation (hot swapping)
- Low space requirements thanks to small footprint (I/O module e.g. 130 mm high and 45 mm wide)
- Scalable diagnostics concept, optionally with module-specific or channel-specific diagnosis of faults of connected sensors or actuators
- Simple configuration with ET 200pro configurator software

#### Application

SIMATIC ET 200pro is the new modular I/O system with high degree of protection IP65/66/67 for local, cabinetless applications. ET 200pro stands out through a small frame size and an innovative installation concept. ET 200pro can be optimized and very flexibly adapted to the requirements of the corresponding automation task with respect to the connection method, required I/Os and fieldbus connection. New features such as the integrated PROFIsafe safety technology, the PROFINET interface and the ability to hotswap modules permit it to be used for a wide range of applications.

With the integrated motor starters, conveyor applications can be implemented optimally, or drives of up to 5.5 kW can be controlled without control cabinet.

#### Design



The tried and tested separation of module and bus/power connection technology, which has already been used for the ET 200eco, is now also used for the digital and analog expansion modules of the ET 200pro. For the interface module this allows use of the T-functionality for the bus and 24 V power supply, and for the expansion modules it permits pre-wiring of sensor/actuator connections. This permanent wiring allows exactly one electronics module to be hot-swapped in the event of a fault without having to switch off the whole station. It can continue to operate fault-free while the module is being replaced. This ensures very high plant availability. When an electronics component is replaced, the whole I/O wiring can remain on the connecting module and does not have to be marked or removed.

#### Modules

The modules of the ET 200pro usually have two or three components. Interface and power modules as well as digital and analog expansion modules comprise:

- One bus connector which constitutes the backplane bus of the system
- One electronics module or interface module
- One connecting module

A backplane bus module is required for operation of motor starters.

A station is constructed from:

- One rack
- One interface module for PROFIBUS DP
- One connecting module for the interface module for PROFIBUS DP
  - CM IM DP direct with up to 6 M20 screwed cable glands
  - CM IM DP ECOFAST Cu (available soon)
  - CM IM DP M12, 7/8" (available soon)

Or optionally

- One interface module for PROFINET IO (available soon) with integrated M12 7/8" connection system
- Max. 16 expansion modules that can be mounted in stations up to 1 m in width

# SIMATIC ET 200 distributed I/Os

## ET 200pro

### Introduction

#### Design (continued)

##### Expansion modules

The following expansion modules are available:

- Digital I/Os
- Analog inputs
- Analog outputs (available soon)
- Connecting modules IO
  - CM IO 4x M12 for digital or analog electronic modules
  - CM IO 8x M12 for digital electronic modules
- Electronic power modules (available soon)
- Connecting modules for power modules
  - CM PM-E directly with up to 2 M20 screwed cable glands
  - CM PM-E ECOFAST Cu
  - CM PM-E 7/8"
- Motor starter

##### Rack

Three different racks are available for mounting the ET 200pro:

- **Narrow rack**  
The narrow rack supports complete pre-assembly on the workbench by means of two mounting flanges outside of the ET 200pro station.



- **Compact rack**  
When the compact rack is used, the small footprint of the ET 200pro system can be used to best advantage.



- **Wide rack**  
The wide rack is required for stations with integrated motor starters

#### Function

The SIMATIC ET 200pro is easily configured with STEP 7. A GSD file is available for interfacing with systems of other manufacturers.

#### Technical specifications

Electronics modules	<ul style="list-style-type: none"> <li>• Digital inputs/outputs</li> <li>• Analog inputs</li> <li>• Analog outputs</li> </ul>
Motor starter	
Cables and connections	M12 circular connector with standard assignment for actuator/sensor
Transmission rate, max.	12 Mbit/s (PROFIBUS DP), 100 Mbit/s (PROFINET IO)
Supply voltage	24 V DC
Current consumption of one ET 200pro (internal and encoder supply, non-switched voltage), up to 55 °C, max.	≤ 5 A
Current consumption of one ET 200pro per infeed (IM, PM, switched voltage, up to 55 °C, max.)	10 A
For overall configuration with looping through (several ET 200pro), up to 55 °C, max.	16 A (with connecting module, directly)
Degree of protection	IP65/66/IP67 for interface, digital and analog modules
Material	Thermoplastic (reinforced with glass fiber)
<b>Ambient conditions</b>	
Temperature	from 0 to 55 °C (-25 °C on request)
Relative humidity	from 5 to 100%
Atmospheric pressure	from 795 to 1080 hPa
<b>Mechanical stress</b>	
• Vibrations	Vibration test conforming to IEC 60068, Part 2-6 (sinusoidal) <ul style="list-style-type: none"> <li>• Constant acceleration 5 g, occasionally 10 g for interface, digital and analog modules</li> <li>• 2 g motor starters</li> </ul>
• Shock	<ul style="list-style-type: none"> <li>• Shock test according to IEC 680068 Part 2 - 27, half-sine, 30 g, 18 ms duration for interface, digital and analog modules</li> <li>• 15 g, 11 ms duration for motor starters</li> </ul>
Approvals	UL, CSA or cULus

#### Overview



Interface modules for handling communication between the ET 200pro and the higher-level master over PROFIBUS DP.

#### Technical specifications

Interface modules	6ES7 154-1AA00-0AB0	6ES7 154-2AA00-0AB0
<b>Supply voltages</b> Supply voltage of electronic components 1L+		
- Rated value (DC)	24 V	24 V
- Short-circuit protection	Yes; with replaceable fuse	Yes; with replaceable fuse
- Reverse polarity protection	Yes; against destruction	Yes; against destruction
<b>Rated value</b>		
- 24 V DC	Yes	Yes
- permissible range, lower limit (DC)	20.4 V	20.4 V
- permissible range, upper limit (DC)	28.8 V	28.8 V
<b>Current consumption</b>		
• from supply voltage 1L+, max.	200 mA	200 mA
<b>Address area</b>		
Addressing range		
- outputs	244 byte	244 byte
- inputs	244 byte	244 byte
<b>PROFIBUS DP</b>		
• Automatic transmission speed detection	Yes	Yes
<b>1st interface</b>		
• Type of interface	PROFIBUS DP	PROFIBUS DP
• Physical characteristics	RS 485	RS 485
<b>Functionality</b>		
- DP slave	Yes	Yes
<b>DP slave</b>		
• Services		
- SYNC/FREEZE	Yes	Yes
- Direct data exchange (lateral communication)	Yes	Yes
- Transmission rates, min.	9.6 kbit/s	9.6 kbit/s
- Transmission rates, max.	12 Mbit/s	12 Mbit/s
<b>Isochronous Mode</b>		
<b>Parameters</b>		
• DPV1 operation	possible	possible
• Diagnostic alarm	w/ parameter	w/ parameter
• Process interrupt	w/ parameter	w/ parameter
• Removal/Insertion alarm	w/ parameter	w/ parameter
• Module replacement in operation	possible	possible
<b>Status information/ interrupts/ diagnostics</b>		
Diagnostic display LED		
• Bus fault BF (red)	Yes	Yes
• Group fault SF (red)	Yes	Yes
• Monitoring 24 V power supply ON (green)	Yes	Yes
• Monitoring the load voltage 24 V DC (green)	Yes; integrated power module	Yes
<b>Isolation</b>		
• Isolation tested with	500 V DC	500 V DC

# SIMATIC ET 200 distributed I/Os

## ET 200pro

### IM 154-1 and IM 154-2 interface modules

#### Technical specifications (continued)

Interface modules	6ES7 154-1AA00-0AB0	6ES7 154-2AA00-0AB0
<b>Galvanic isolation</b>		
• between backplane bus and electronic components	No	No
• between supply load and electronic components	Yes	Yes
<b>Environmental requirements</b>		
Operating temperature		
- min.	-25 °C	-25 °C
- max.	55 °C	55 °C
Storage/transportation temperature		
- min.	-40 °C	-40 °C
- max.	70 °C	70 °C
Degree of protection and class of protection		
- IP65	Yes	Yes
- IP66	Yes	Yes
- IP67	Yes	Yes
<b>Dimensions and weight</b>		
• Weight, approx.	395 g	415 g
• Width	90 mm	90 mm
• Height	130 mm	130 mm
• Depth	59.3 mm	59.3 mm
<b>General information</b>		

#### Ordering data

Ordering data	Order No.
<b>IM154-1 interface module</b> A	<b>6ES7 154-1AA00-0AB0</b>
For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP	
<b>IM154-2 High Feature interface module</b> A	<b>6ES7 154-2AA00-0AB0</b>
For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP; support of PROFIsafe	
<b>Accessories</b>	
<b>CM IM DP ECOFAST connecting module</b> A	<b>6ES7 194-4AA00-0AA0</b>
For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 ECOFAST Cu connections	
<b>CM IM DP direct connecting module</b> A	<b>6ES7 194-4AC00-0AA0</b>
For connecting PROFIBUS DP and the 24 V power supply directly to the PROFIBUS interface modules, up to six M20 screwed cable glands	
<b>CM IM DP M12, 7/8" connecting module</b> A	<b>6ES7 194-4AD00-0AA0</b>
For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 x M12 and 2 x 7/8"	

A) Subject to export regulations: AL: N and ECCN: EAR99H

#### Ordering data

#### Order No.

#### Accessories for CM IM DP ECOFAST

#### PROFIBUS ECOFAST hybrid cable, pre-assembled

With 2 ECOFAST connectors, trailing-type cable  
2 x CU 0.64 mm<sup>2</sup> and  
4 x Cu 1.5 mm<sup>2</sup>

• 1.5 m long	<b>6XV1 830-7BH15</b>
• 3.0 m long	<b>6XV1 830-7BH30</b>
• 5.0 m long	<b>6XV1 830-7BH50</b>
• 10 m long	<b>6XV1 830-7BN10</b>
• 15 m long	<b>6XV1 830-7BN15</b>
• 20 m long	<b>6XV1 830-7BN20</b>
• 25 m long	<b>6XV1 830-7BN25</b>
• 30 m long	<b>6XV1 830-7BN30</b>
• 35 m long	<b>6XV1 830-7BN35</b>
• 40 m long	<b>6XV1 830-7BN40</b>
• 45 m long	<b>6XV1 830-7BN45</b>
• 50 m long	<b>6XV1 830-7BN50</b>

#### PROFIBUS ECOFAST hybrid cable GP, pre-assembled

With 2 ECOFAST connectors, trailing-type cable  
2 x CU 0.64 mm<sup>2</sup> and  
4 x Cu 1.5 mm<sup>2</sup>

• 1.5 m long	<b>6XV1 860-3PH15</b>
• 3.0 m long	<b>6XV1 860-3PH30</b>
• 5.0 m long	<b>6XV1 860-3PH50</b>
• 10 m long	<b>6XV1 860-3PN10</b>
• 15 m long	<b>6XV1 860-3PN15</b>
• 20 m long	<b>6XV1 860-3PN20</b>
• 25 m long	<b>6XV1 860-3PN25</b>
• 30 m long	<b>6XV1 860-3PN30</b>
• 35 m long	<b>6XV1 860-3PN35</b>
• 40 m long	<b>6XV1 860-3PN40</b>
• 45 m long	<b>6XV1 860-3PN45</b>
• 50 m long	<b>6XV1 860-3PN50</b>

#### PROFIBUS ECOFAST hybrid cable, non-assembled

Trailing-type cable  
2 x CU 0.64 mm<sup>2</sup> and  
4 x Cu 1.5 mm<sup>2</sup>

• 50 m long	<b>6XV1 830-7AN50</b>
• 100 m long	<b>6XV1 830-7AT10</b>

#### PROFIBUS ECOFAST hybrid cable GP, non-assembled

Trailing-type cable  
2 x CU 0.64 mm<sup>2</sup> and  
4 x Cu 1.5 mm<sup>2</sup>

• 50 m long	<b>6XV1 860-4PN50</b>
• 100 m long	<b>6XV1 860-4PT10</b>

#### PROFIBUS ECOFAST hybrid connector 180

ECOFAST Cu, 2 x Cu,  
4 x 1.5 mm<sup>2</sup>,  
HANBRID connector

• with male insert, 5 per pack	<b>6GK1 905-0CA00</b>
• with female insert, 5 per pack	<b>6GK1 905-0CB00</b>

Ordering data	Order No.	Ordering data	Order No.
<b>Accessories for CM IM DP ECOFAST</b> (continued)		<b>Accessories for CM IM DP M12, 7/8"</b> (continued)	
<b>PROFIBUS ECOFAST hybrid connector angular</b> ECOFAST Cu, 2 x Cu, 4 x 1.5 mm <sup>2</sup> , HANBRID connector		<b>M12 cable connector</b> For ET 200eco, with axial cable outlet	
• with male insert, 5 per pack	<b>6GK1 905-0CC00</b>	• with male insert, 5 per pack	<b>6GK1 905-0EA00</b>
• with female insert, 5 per pack	<b>6GK1 905-0CD00</b>	• with female insert, 5 per pack	<b>6GK1 905-0EB00</b>
<b>ECOFAST covering cap</b>	<b>6ES7 194-1JB10-0XA0</b>	<b>7/8" cable connector</b> For ET 200eco, with axial cable outlet	
For protecting unused bus connections for ET 200pro; 10 items per pack		• with male insert, 5 per pack	<b>6GK1 905-0FA00</b>
<b>Accessories for CM IM DP direct</b>		• with female insert, 5 per pack	<b>6GK1 905-0FB00</b>
<b>PROFIBUS trailing cable</b>	<b>6XV1 830-3EH10</b>	<b>M12 covering cap</b>	<b>3RX9 802-0AA00</b>
Max. acceleration 4 m/s <sup>2</sup> , at least 3,000,000 bending cycles, bending radius 60 mm, 2-core shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1,000 m		For protection of unused M12 connections with ET 200pro	
<b>PROFIBUS FC Food bus cable</b>	<b>6XV1 830-0GH10</b>	<b>Sealing cap 7/8"</b>	<b>6ES7 194-3JA00-0AA0</b>
With PE sheath for use in the food and beverages industry, 2-core, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1,000 m		For protecting unused 7/8" connections for ET 200pro; 10 items per pack	
<b>PROFIBUS FC Robust bus cable</b>	<b>6XV1 830-0JH10</b>	<b>General accessories</b>	
With PUR sheath for use under conditions of extreme mechanical stress and aggressive chemicals, 2-core, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1,000 m		<b>ET 200pro rack</b>	
<b>Power cable</b>	<b>6XV1 830-8AH10</b>	• Narrow, for interface, electronics and power modules	
5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1,000 m		- 500 mm	<b>6ES7 194-4GA00-0AA0</b>
<b>Accessories for CM IM DP M12, 7/8"</b>		- 1000 mm	<b>6ES7 194-4GA10-0AA0</b>
<b>PROFIBUS M12 connecting cable</b>		- 2000 mm, can be cut to length	<b>6ES7 194-4GA20-0AA0</b>
Pre-assembled with two M12 connectors, 5-pin		• Compact, for interface, electronics and power modules	
• 1.5 m long	<b>6XV1 830-3DH15</b>	- 500 mm	<b>6ES7 194-4GC00-0AA0</b>
• 2.0 m long	<b>6XV1 830-3DH20</b>	- 1000 mm	<b>6ES7 194-4GC10-0AA0</b>
• 3.0 m long	<b>6XV1 830-3DH30</b>	- 2000 mm, can be cut to length	<b>6ES7 194-4GC20-0AA0</b>
• 5.0 m long	<b>6XV1 830-5DH50</b>	• Wide, for interface, electronics, power modules and motor starters	
• 10 m long	<b>6XV1 830-3DN10</b>	- 500 mm	<b>6ES7 194-4GB00-0AA0</b>
• 15 m long	<b>6XV1 830-3DN15</b>	- 1000 mm	<b>6ES7 194-4GB10-0AA0</b>
		- 2000 mm, can be cut to length	<b>6ES7 194-4GB20-0AA0</b>
<b>7/8" connecting cable to power supply</b>		<b>Spare fuse</b> A	<b>6ES7 194-4HB00-0AA0</b>
5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, pre-assembled with two 7/8" connectors, 5-pin		12.5 A quick-response, for interface and power modules, 10 items per package unit	
• 1.5 m long	<b>6XV1 822-5BH15</b>	<b>Technical product data</b>	<b>6ES7 991-0CC00-0YX0</b>
• 2.0 m long	<b>6XV1 822-5BH20</b>	For CAX applications, one-off license	
• 3.0 m long	<b>6XV1 822-5BH30</b>	<b>Technical product data</b>	<b>6ES7 991-0CC00-0YX2</b>
• 5.0 m long	<b>6XV1 822-5BH50</b>	For CAX applications, one-off license, update service	
• 10 m long	<b>6XV1 822-5BN10</b>	<b>SIMATIC Manual Collection</b> D	<b>6ES7 998-8XC01-8YE0</b>
• 15 m long	<b>6XV1 822-5BN15</b>	Electronic manuals on CD, 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)	
		<b>SIMATIC Manual Collection – Update service for 1 year</b> D	<b>6ES7 998-8XC01-8YE2</b>
		Scope of delivery: Current CD "S7 Manual Collection" and the three subsequent updates	

A) Subject to export regulations: AL: N and ECCN: EAR99H

D) Subject to export regulations: AL: N and ECCN: 5D992B1

# SIMATIC ET 200 distributed I/Os

## ET 200pro

### IM 154-4 PN interface modules

#### Overview



Interface modules for handling communication between the ET 200pro and the higher-level programmable logic controller over PROFINET IO.

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Ordering data	Order No.	Order No.
<b>IM 154-4 PN High Feature interface module</b> For communication between ET 200pro and higher-level controllers over PROFINET IO; support of PROFIsafe <i>Accessories</i> <b>M12 covering cap</b> For protection of unused M12 connections with ET 200pro <b>Micro Memory Card, 3.3 V, NFLASH</b> <ul style="list-style-type: none"> <li>• 64 KB</li> <li>• 128 KB</li> <li>• 512 KB</li> <li>• 2 MB</li> <li>• 4 MB</li> <li>• 8 MB</li> </ul> <b>IE M12 connecting cables</b> Pre-assembled with two M12 connectors <ul style="list-style-type: none"> <li>• 0.3 m long</li> <li>• 0.5 m long</li> <li>• 1.0 m long</li> <li>• 1.5 m long</li> <li>• 2.0 m long</li> <li>• 3.0 m long</li> <li>• 5.0 m long</li> <li>• 10 m long</li> <li>• 15 m long</li> </ul>	A <b>6ES7 154-4AB00-0AB0</b>  <b>3RX9 802-0AA00</b>  <b>6ES7953-8LF11-0AA0</b> <b>6ES7953-8LG11-0AA0</b> <b>6ES7953-8LJ11-0AA0</b> <b>6ES7953-8LL11-0AA0</b> <b>6ES7953-8LM11-0AA0</b> <b>6ES7953-8LP11-0AA0</b>  <b>6XV1 870-8AE30</b> <b>6XV1 870-8AE50</b> <b>6XV1 870-8AH10</b> <b>6XV1 870-8AH15</b> <b>6XV1 870-8AH20</b> <b>6XV1 870-8AH30</b> <b>6XV1 870-8AH50</b> <b>6XV1 870-8AN10</b> <b>6XV1 870-8AN15</b>	<b>7/8" connecting cable to power supply</b> 5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, pre-assembled with two 7/8" connectors, 5-pin <ul style="list-style-type: none"> <li>• 1.5 m long</li> <li>• 2.0 m long</li> <li>• 3.0 m long</li> <li>• 5.0 m long</li> <li>• 10 m long</li> <li>• 15 m long</li> </ul> <b>Power cables</b> 5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1,000 m <b>7/8" cable connector</b> For ET 200eco, with axial cable outlet <ul style="list-style-type: none"> <li>• with male insert, 5 per pack</li> <li>• with female insert, 5 per pack</li> </ul> <b>Spare fuse</b> 12.5 A quick-response, for interface and power modules, 10 items per package unit <b>SIMATIC Manual Collection</b> Electronic manuals on CD, 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) <b>SIMATIC Manual Collection – Update service for 1 year</b> Scope of delivery: Current CD "S7 Manual Collection" and the three subsequent updates
		<b>6XV1 822-5BH15</b> <b>6XV1 822-5BH20</b> <b>6XV1 822-5BH30</b> <b>6XV1 822-5BH50</b> <b>6XV1 822-5BN10</b> <b>6XV1 822-5BN15</b>  <b>6XV1 830-8AH10</b>  <b>6GK1 905-0FA00</b> <b>6GK1 905-0FB00</b>  A <b>6ES7 194-4HB00-0AA0</b>  D <b>6ES7 998-8XC01-8YE0</b>  D <b>6ES7 998-8XC01-8YE2</b>

A) Subject to export regulations: AL: N and ECCN: EAR99H  
 D) Subject to export regulations: AL: N and ECCN: 5D992B1

#### Overview



- Expansion modules with digital inputs/outputs for connection of actuators/sensors
- With scalable diagnostics
  - Standard modules with module-specific diagnostics
  - High Feature modules with channel-specific diagnostics and parameterizable input delay or process interrupts (DI, up to 6 channels)
- Double or single assignment can be implemented for each M12 in the case of the 8DI module by selecting CM IO 4 x M12 or CM IO 8 x M12

# SIMATIC ET 200 distributed I/Os

## ET 200pro

### EM 141 and EM 142 digital expansion modules

#### Technical specifications

Digital input modules	6ES7 141-4BF00-0AA0	6ES7 141-4BF00-0AB0
<b>Supply voltages</b>		
Rated value		
- 24 V DC	Yes	Yes
- permissible range, lower limit (DC)	20.4 V	20.4 V
- permissible range, upper limit (DC)	28.8 V	28.8 V
- Reverse polarity protection	Yes; against destruction if transmitter outputs reversed	Yes; against destruction; loads are activated.
<b>Current consumption</b>		
• from backplane bus 5 V DC, max.	20 mA	40 mA
• from supply voltage 1L+, max.	20 mA	20 mA
• Power dissipation, typical	2.5 W	2.5 W
<b>Address area</b>		
Occupied address area		
- Inputs	1 byte	1 byte
<b>FH systems</b>		
• Module for fail-safe applications	No	No
<b>Clock synchronism</b>		
• Clock synchronous operation	No	No
<b>Digital inputs</b>		
• Number of digital inputs	8	8
Number of inputs that can be driven in parallel		
• all mounting positions		
- up to 55 °C	8	8
Length of cable		
- Length of cable shielded, max	30 m	30 m
- Length of cable unshielded, max	30 m	30 m
• Input characteristic to comply with IEC 1131, Type 1	Yes	No
• Input characteristic to comply with IEC 1131, Type 2	No	Yes
Input voltage		
• Rated value, DC	24 V	24 V
• for signal 0	-3 to +5 V	-3 to +5 V
• for signal 1	13 to 30 V	11 to 30 V
Input current		
- for 1 signal, typical	7 mA	7 mA
Input delay (at rated value of the input voltage)		
• For standard inputs		
- can be assigned parameters	No	Yes
- at 0 to 1, min.	1.2 ms	0.5 ms; 0.5 ms/3 ms/ 15 ms/20 ms
- at 0 to 1, max.	4.8 ms	20 ms
- at 1 to 0, min	1.2 ms	0.5 ms 0.5 ms/3 ms/ 15 ms/20 ms
- at 1 to 0, max.	4.8 ms	20 ms

Digital input modules	6ES7 141-4BF00-0AA0	6ES7 141-4BF00-0AB0
<b>Sensor supply</b>		
• Number of outputs	8	8
Output current		
- up to 55°C., max.	1 A	1 A
<b>Sensor</b>		
Connectable encoders		
- 2-wire BEROS	Yes	Yes
- permissible closed-circuit current (2-wire BEROS), max.	1.5 mA	1.5 mA
<b>Parameters</b>		
• Diagnostic interrupt		Yes
• Process interrupt		for 6 channels
• Diagnostics for wire breakage		per channel
• Diagnostics for short-circuit		per channel
	transmitter supply to M; per module	
<b>Status information/ interrupts/ diagnostics</b>		
Diagnostics		
• Diagnostic functions	Yes	Yes; per channel, parameter-assignment
• Diagnostic information can be read out	Yes	Yes
• Wire break		Yes; monitoring, I < 0,3 mA
• Short circuit	Yes; transmitter supply to M; per module	Yes
Diagnostic display LED		
• Group fault SF (red)	Yes	Yes
• Status display digital input (green)	Yes; per channel	Yes; per channel
<b>Isolation</b>		
• Isolation tested with	500 V DC	500 V DC
<b>Galvanic isolation</b>		
Digital input functions		
- between the channels	No	No
- between the channels and the backplane bus	Yes	Yes
<b>Permissible potential difference</b>		
• between different circuits	75 V DC / 60 V AC	75 V DC / 60 V AC
<b>Environmental requirements</b>		
Degree of protection and class of protection		
- IP65	Yes	Yes
- IP66	Yes	Yes
- IP67	Yes	Yes
<b>Dimensions and weight</b>		
• Weight, approx.	140 g	140 g
• Width	45 mm	45 mm
• Height	130 mm	130 mm
• Depth	35 mm	35 mm; without connection module



#### Technical specifications (continued)

Digital output modules	6ES7 142-4BD00-0AA0	6ES7 142-4BD00-0AB0
<b>Voltages and currents</b>		
Load voltage 2L+		
- Rated value (DC)	24 V	24 V
- Short-circuit protection	Yes; per channel, electronically	Yes; per channel, electronically
- Reverse polarity protection	Yes; against destruction; loads are activated.	Yes; against destruction; loads are activated.
<b>Current consumption</b>		
• from load voltage 2L+ (no load), max.	20 mA	40 mA
• from backplane bus 5 V DC, max.	20 mA	40 mA
• Power dissipation, typical	2 W	2.5 W
<b>Address area</b>		
Address space per module		
- With packing	4 bit	4 bit
- without packing	1 byte	1 byte
<b>FH systems</b>		
• Module for fail-safe applications	No	No
<b>Digital outputs</b>		
• Number of digital outputs	4	4
• Length of cable shielded, max.	30 m	30 m
• Length of cable unshielded, max.	30 m	30 m
• Short-circuit protection of the output	Yes; per channel, electronically	Yes; per channel, electronically
- Response threshold, type.	3	3
• Inductive switch-off voltage limited to	2L+ (- 47 V)	2L+ (- 47 V)
• Lamp load, max.	10 W	10 W
• Driving a digital input	Yes	Yes
Output voltage		
- for 1 signal	2L+ (- 0.8 V)	2L+ (- 0.8 V)
Output current		
- for 1 signal rated value	2 A	2 A
- for 0 signal residual current, max.	0.5 mA	0.5 mA
Parallel switching of 2 outputs		
- to increase power	No	No
- to redundantly drive a load	Yes	Yes
Switching frequency		
- at resistive load, max.	100 Hz	100 Hz
- at inductive load, max.	0.5 Hz	0.5 Hz
- at lamp load, max.	1 Hz	1 Hz
Summation current of the outputs (per group)		
- up to 55 °C, max.	4 A	4 A
Load impedance range		
- lower limit	12 Ω	12 Ω
- upper limit	4 kΩ	4 kΩ

Digital output modules	6ES7 142-4BD00-0AA0	6ES7 142-4BD00-0AB0
<b>Parameters</b>		
• Diagnostics for wire breakage		per channel
• Diagnostics for short-circuit		per channel
• Behavior at CPU/Master STOP		per channel
<b>Status information/ interrupts/ diagnostics</b>		
• Applying substitute values		Yes
Interrupts		
- Diagnostic interrupt		Yes
Diagnostics		
- Diagnostic functions	Yes	Yes
- Diagnostic information can be read out	Yes	Yes
- Wire break		Yes
- Short circuit	Yes; short-circuit of the outputs to M; per module	Yes
Diagnostic display LED		
- Group fault SF (red)	Yes	Yes
- Status display digital output (green)	Yes	Yes
- Channel fault display F (red)		Yes
<b>Isolation</b>		
• Isolation tested with	500 V DC	500 V DC
<b>Galvanic isolation</b>		
• between backplane bus and all other circuit components		Yes
• between the channels and the backplane bus		Yes
Digital output functions		
- between the channels	No	No
- between the channels and the backplane bus	Yes	Yes
<b>Permissible potential difference</b>		
• across different circuits		75 V DC/ 60 V AC
<b>Dimensions and weight</b>		
• Weight, approx.	140 g	140 g
• Width	45 mm	45 mm
• Height	130 mm	130 mm
• Depth	35 mm	35 mm; without connection module

# SIMATIC ET 200 distributed I/Os

## ET 200pro

### EM 141 and EM 142 digital expansion modules

Ordering data	Order No.	Order No.
<b>8 DI digital input module</b> 24 V DC, with module-specific diagnostics, including bus module. Connecting module must be ordered separately	A <b>6ES7 141-4BF00-0AA0</b>	<b>Accessories</b> <b>CM IO 4 x M12 connecting module</b> 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro
<b>8 DI High Feature digital input module</b> 24 V DC, with channel-specific diagnostics, including bus module. Connecting module must be ordered separately	A <b>6ES7 141-4BF00-0AB0</b>	<b>CM IO 8 x M12 connecting module</b> 8 M12 sockets for connecting digital sensors or actuators to ET 200pro
<b>4 DO digital output module</b> 24 V DC, 2 A, with module-specific diagnostics, including bus module. Connecting module must be ordered separately	A <b>6ES7 142-4BD00-0AA0</b>	<b>Module identification labels</b> For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each
<b>4 DO High Feature digital output module</b> 24 V DC, 2 A, with channel-specific diagnostics, including bus module. Connecting module must be ordered separately	A <b>6ES7 142-4BD00-0AB0</b>	<b>M12 covering cap</b> For protection of unused M12 connections with ET 200pro
		<b>Inscription labels</b> 20 x 7, pale turquoise, 340 items per pack
		<b>M12 connector, can be assembled in the field</b> 5-pin, for connecting digital sensors and actuators, 1 unit
		<b>M12 connecting cable</b> With PUR sheath, for connecting digital sensors and actuators, pre-assembled, with connector and socket at each end
		<ul style="list-style-type: none"> <li>• 3 x 0.34 mm<sup>2</sup>, fixed lengths, 1 unit                             <ul style="list-style-type: none"> <li>- 0.6 m <b>3RX1 633</b></li> <li>- 1 m <b>3RX1 634</b></li> <li>- 1.5 m <b>3RX1 635</b></li> </ul> </li> <li>• 4 x 0.34 mm<sup>2</sup>, fixed lengths, 1 unit                             <ul style="list-style-type: none"> <li>- 0.6 m <b>3RX1 640</b></li> <li>- 1 m <b>3RX1 641</b></li> <li>- 1.5 m <b>3RX1 642</b></li> </ul> </li> </ul>

A) Subject to export regulations: AL: N and ECCN: EAR99H

#### Overview



- Expansion modules with analog inputs and outputs for connecting sensors/actuators
- With diagnostics functionality, limit values and substitute values

#### Technical specifications

Analog expansion modules	6ES7 144-4FF00-0AB0	6ES7 144-4GF00-0AB0
<b>Voltages and currents</b>		
Load voltage L+		
- Rated value (DC)	24 V	24 V
- Reverse polarity protection	Yes; against destruction	Yes; against destruction
<b>Current consumption</b>		
• from backplane bus 5 V DC, max.	10 mA	10 mA
• Power dissipation, typical	1.1 W	1.1 W
<b>Address area</b>		
Address space per module		
- Address space per module, max.	8 byte	8 byte
<b>Analog inputs</b>		
• Number of analog inputs	4	4
• Length of cable shielded, max	30 m	30 m
• Permiss. input voltage for voltage input (destr. limit), max.	35 V	
• Perm. input volt. for the current input (destr. lim.), max.		40 mA
• Cycle time (all channels)	267 ms	267 ms
Input ranges (rated values), voltages		
• Voltage	Yes	
• 1 to +5 V	Yes	
• -10 V to +10 V	Yes	
• Input resistance (-10 V to +10 V)	100 kΩ	
• -5 V to +5 V	Yes	
Input ranges (rated values), currents		
• Current		Yes
• -20 to +20 mA		Yes
• Input resistance (-20 to +20 mA)		50 Ω
• 4 to 20 mA		Yes
• Input resistance (4 to 20 mA)		50 Ω

Analog expansion modules	6ES7 144-4FF00-0AB0	6ES7 144-4GF00-0AB0
<b>Analog value formation</b>		
• Measuring principle	integrating	integrating
Integration and conversion time/triggering per channel		
• with over-range (bits incl. sign), max	15 bit; at +/- 10 V, at +/- 5 V 14 bit at 0 to 10, at 1 to 5 V	15 bit; at +/- 20 mA 14 bit at 0 to 20 mA, 4 to 20 mA
• Integration time, ms	20/ 16,667	20/ 16,667
• noise suppression for interference frequency f1, in Hz	50/ 60	50/ 60
• Conversion time (per channel)	67 ms	67 ms
Smoothing of measured values		
• Parameterizable	Yes	Yes
• None	Yes; 1 x cycle time	Yes; 1 x cycle time
• Weak	Yes; 4 x cycle time	Yes; 4 x cycle time
• Medium	Yes; 16 x cycle time	Yes; 16 x cycle time
• Strong	Yes; 64 x cycle time	Yes; 64 x cycle time
<b>Sensor supply</b>		
• Short-circuit protection	Yes; per module; electronically against ground	Yes; per module; electronically against ground
<b>Sensor</b>		
Sensing element connection		
• for current measurement, as 2-wire measuring transducer		Yes
• for current measurement, as 4-wire measuring transducer		Yes

# SIMATIC ET 200 distributed I/Os

## ET 200pro

### EM 144 and EM 145 analog expansion modules

#### Technical specifications (continued)

Analog expansion modules	6ES7 144-4FF00-0AB0	6ES7 144-4GF00-0AB0
<b>Error/accuracies</b>		
• Linearity error (relative to the input range)	+/- 0.01 %	+/- 0.01 %
• Temperature error (relative to the input range)	+/- 0.002 %/K	+/- 0.002 %/K
• Crosstalk between the inputs, min.	-50 dB	-50 dB
• Repeatab. in the settled state at 25°C (rel. to output range)	+/- 0.025 %	+/- 0.025 %
Operational limit in the entire temperature range		
• relative to the input range, voltage	+/- 0.15 %	
• relative to the input range, current		+/- 0.15 %
Basic error limit (operational limit at 25 °C)		
• relative to the input range, voltage	+/- 0.1 %	
• relative to the input range, current		+/- 0.1 %
Interference voltage suppression for $f = n \times (f_l \pm 1 \%)$		
• Series-mode interference (peak value of interference < rated value)	50 dB	50 dB
• Common-mode interference (USS < 2.5 V), min.	70 dB; interference voltage < 5 V	70 dB; interference voltage < 5 V
<b>Status information/ interrupts/ diagnostics</b>		
Interrupts		
• Diagnostic interrupt	Yes; parameter-assignable	Yes; parameter-assignable
• Limit value interrupt	Yes	Yes
• Process interrupt	Yes; (limit value interrupt), parameter-assignable for channel 0	Yes; (limit value interrupt), parameter-assignable for channel 0
Diagnostics		
• Diagnostics		Yes
• Wire break	Yes; at 1 to 5 V	Yes; at 4 to 20 mA
• Short circuit	Yes; at 1 to 5 V	Yes; at 4 to 20 mA
• Group error		Yes
Diagnostic display LED		
• Group fault SF (red)	Yes	Yes
<b>Isolation</b>		
• Isolation tested with	500 V DC	500 V DC
<b>Galvanic isolation</b>		
Analog output functions		
• between the channels	No	No
• between the channels and the backplane bus	Yes	Yes
<b>Permissible potential difference</b>		
• between the inputs and MANA (UCM)	5 Vpp AC	5 Vpp AC
• between MANA and Minternal (UISO)	500 V DC	500 V DC
<b>Dimensions and weight</b>		
• Weight, approx.	150 g	150 g
• Width	45 mm	45 mm
• Height	130 mm	130 mm
• Depth	35 mm	35 mm

#### Ordering data

#### Order No.

<b>4AI U analog input module</b>	A	<b>6ES7 144-4FF00-0AB0</b>
High Feature, $\pm 10$ V; $\pm 5$ V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connecting module must be ordered separately		
<b>4AI I analog input module</b>	A	<b>6ES7 144-4GF00-0AB0</b>
High Feature, $\pm 20$ mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connecting module must be ordered separately		
<b>4AO U analog output module</b>	A	<b>6ES7 145-4FF00-0AB0</b>
High Feature, $\pm 10$ V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connecting module must be ordered separately		
<b>4AO I analog output module</b>	A	<b>6ES7 145-4GF00-0AB0</b>
High Feature, $\pm 20$ mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connecting module must be ordered separately		
<b>Accessories</b>		
<b>CM IO 4 x M12 connecting module</b>	A	<b>6ES7 194-4CA00-0AA0</b>
4 M12 sockets for connecting digital or analog sensors or actuators with ET 200pro		
<b>Module identification labels</b>		<b>6ES7 194-4HA00-0AA0</b>
For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each		
<b>M12 covering cap</b>		<b>3RX9 802-0AA00</b>
For protection of unused M12 connections with ET 200pro		

A) Subject to export regulations: AL: N and ECCN: EAR99H

#### Overview



- PM-E 24 V DC power module

#### Application

The PM-E 24 V DC power module is used for supplementary supply or division into groups of the 24 V load voltage for electronics modules within an ET 200pro station.

The following module is available:

- PM-E 24 V DC (available soon)
- PM-E connection module (must be ordered separately):
- CM PM-E direct (with up to 2 M20 cable glands)
- CM PM-E ECOFAST Cu (with one ECOFAST Cu connection)
- CM PM-E 7/8" (with one 7/8" female connector)

#### Ordering data

#### Order No.

<b>PM-E 24 V DC power module</b>	A	<b>6ES7148-4CA00-0AA0</b>
For backfeed and group formation of the 24 V DC load supply for electronic modules within an ET 200pro station.		
<b>Accessories</b>		
<b>CM PM-E ECOFAST connecting module</b>	A	<b>6ES7 194-4BA00-0AA0</b>
For backfeed of 24 V load voltage, 1 ECOFAST Cu connection		
<b>CM PM-E direct connecting module</b>	A	<b>6ES7 194-4BC00-0AA0</b>
For backfeed of 24 V load voltage, up to 2 M20 screwed cable glands		
<b>CM PM-E 7/8" connecting module</b>	A	<b>6ES7 194-4BD00-0AA0</b>
For backfeed of 24 V load voltage, 1 x 7/8"		
<b>Spare fuse</b>	A	<b>6ES7 194-4HB00-0AA0</b>
12.5 A quick-response, for interface and power modules, 10 items per package unit		
<b>Accessories for CM PM-E ECOFAST</b>		
<b>PROFIBUS ECOFAST hybrid connector 180</b>		
ECOFAST Cu, 2 x Cu, 4 x 1.5 mm <sup>2</sup> , HANBRID connector		
• with male insert, 5 per pack		<b>6GK1 905-0CA00</b>
• with female insert, 5 per pack		<b>6GK1 905-0CB00</b>
<b>PROFIBUS ECOFAST hybrid connector angular</b>		
ECOFAST Cu, 2 x Cu, 4 x 1.5 mm <sup>2</sup> , HANBRID connector		
• with male insert, 5 per pack		<b>6GK1 905-0CC00</b>
• with female insert, 5 per pack		<b>6GK1 905-0CD00</b>
<b>Accessories for CM PM-E direct</b>		
<b>Power cables</b>		<b>6XV1 830-8AH10</b>
5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1,000 m		
<b>Accessories for CM PM-E 7/8"</b>		
<b>7/8" connecting cable to power supply</b>		
5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, pre-assembled with two 7/8" connectors, 5-pin		
• 1.5 m long		<b>6XV1 822-5BH15</b>
• 2.0 m long		<b>6XV1 822-5BH20</b>
• 3.0 m long		<b>6XV1 822-5BH30</b>
• 5.0 m long		<b>6XV1 822-5BH50</b>
• 10 m long		<b>6XV1 822-5BN10</b>
• 15 m long		<b>6XV1 822-5BN15</b>
<b>7/8" cable connector</b>		
With axial cable outlet		
• with male insert, 5 per pack		<b>6GK1 905-0FA00</b>
• with female insert, 5 per pack		<b>6GK1 905-0FB00</b>

A) Subject to export regulations: AL: N and ECCN: EAR99H

# SIMATIC ET 200 distributed I/Os

## ET 200pro

### ET 200pro motor starters

#### Overview



#### Motor starter

- Only two variants up to 5.5 kW
- All settings can be configured via the bus
- Extensive diagnostic messages
- Overload can be acknowledged via remote reset
- Current asymmetry monitoring
- Stall protection
- Emergency start function in the event of overload
- Current value transfer via bus
- Current limit value monitoring
- Direct-on-line or reversing starters
- Power bus can be plugged in using the new HAN Q4/2 plug-in connectors
- Conductor cross-sections up to 6 x 4 mm<sup>2</sup>
- 25 A per segment (power is looped through using jumpers)
- Optionally available with 400 V AC brake contact.

#### Maintenance switch module

The maintenance switch module with its load disconnection function is used for safe isolation of the 400 V operating voltage while maintenance work is being undertaken in the plant and offers an integral group fusing function (i.e. additional group short-circuit protection for all externally supplied motor starters).

All stations can be optionally fitted with a maintenance switch module depending on the power distribution concept.

#### Safety local maintenance switch module

With the Safety Local modules

- Safety local maintenance switch module and
- 400 V shutdown module

can, when connected appropriately, achieve Category 4 safety level.

The safety local maintenance switch module is a maintenance switch that can be parameterized using a DIP switch and which has integral safety evaluation functions.

It is used

- To connect a 1 or 2 channel EMERGENCY-STOP circuit up to Category 3-4/Sil3 (protective door or EMERGENCY-STOP pushbutton) and parameterizable start response and
- For activating the 400 V shutdown module by means of a safety rail signal.

#### Benefits

The ET 200pro motor starter offers the following advantages:

- High flexibility thanks to its modular, compact construction
- Minimal variation in motor starter designs (2 devices up to 5.5 kW)
- Comprehensive parameterization with STEP 7 HW Config
- Greater plant availability due to rapid replacement of devices (easy mounting and plug-in wiring)
- Comprehensive diagnostics and information for preventative maintenance
- Parameterizable inputs for local control functions (High Feature)
- Cabinetless installation thanks to the high IP65 degree of protection

#### Application

The ET 200pro motor starters can be used to protect and switch any three-phase load. They are an integral component of ET 200pro and are designed to the high degree of protection IP65. They are therefore ideal for use in modular, distributed I/O without a control cabinet or control box.

The protection concept with electronic overload evaluation and the use of the SIRIUS switchgear – frame size S00 – achieves a number of additional advantages for the Standard and High Feature motor starters which quickly pay off, especially for manufacturing processes that have high plant downtime costs:

- The bit-modular design makes engineering much simpler. When the ET 200pro motor starter is used, the parts list is reduced to two essential items per load feeder circuit: the bus module and the motor starter. The ET 200pro is therefore ideally suited to modular machine concepts or solutions in conveyor systems and in machine tool manufacture.
- Expansions can be easily implemented by subsequent connection of additional modules. The innovative plug-in technology replaces the previously required wiring. Thanks to the "hot swapping" function (removal and insertion during normal operation), the motor starter can be replaced in seconds should it become necessary without the need for the ET 200pro station and therefore the plant process to be stopped. This makes the motor starters especially suitable for applications which require a high level of availability. The minimal variance (2 devices up to 5.5 kW) also reduces inventory costs.

The ordering option for motor starters with a 400 V AC brake output enables motors with 400 V AC brakes to be activated. The four locally acting inputs available on the High Feature motor starter can be used to implement special, autonomous functions that act independently of the bus and higher-level control, e.g. quick-stop functions for slider controls or end-stop shutdown. The status of these inputs is also signaled to the control.

When the optional maintenance switch module with the load disconnection and group fusing functions is used for the ET 200pro, the 400 V supply for the motor starter can be connected and disconnected locally.

#### Technical specifications

	Motor starter Standard DSe, RSe	Motor starter High Feature DSe, RSe
<b>General data</b>		
Motor starters that can be connected to ET 200pro or modules 110 mm in width	Max. 8	
Mounting dimensions (W x H x D) in mm		
• Direct starter and reversing starter	110 x 230 x 150	
Permissible ambient temperature		
• Operation	-25 °C to +55 °C, above +40 °C with derating	
• During storage	-40 °C ... +70 °C	
Permissible mounting position	Vertical, horizontal	
Vibration resistance in accordance with IEC 60068, Part 2-6	2 g	
Shock resistance in accordance with IEC 60068, Part 2-27	Half-sine 15 g/11 ms	
Current consumption		
• From auxiliary circuit L+/M (U1)	Approx. 40 mA	
• From auxiliary circuit A1/A2 (U2)	Approx. 200 mA	
Rated operating current for power bus $I_e$	25 A	
Rated operating voltage $U_e$	400 V	
Approval DIN VDE 0106, Part 101	up to 500 V	
Acc. to CSA and UL	up to 600 V	
For conductor cross-sections		
• Power infeed	max. 6 x 4 mm <sup>2</sup>	
Degree of protection	IP65	
Touch protection	Safe against finger touch	
Degree of contamination	3, IEC 60664 (IEC 61131)	
Rated impulse withstand voltage $U_{imp}$	6 kV	
Rated insulation voltage $U_i$	400 V	
Rated operating current for starter $I_e$		
• AC-1/2/3 at 40 °C		
- at 400 V	0.15 to 2.0/1.5 to 12.0 A	
- at 500 V	0.15 to 2.0/1.5 to 9.0 A	
• AC-4 at 40 °C		
- at 400 V	0,15 to 2,0/1,5 to 4,0 A	
Rated short-circuit switching capacity	100 kA at 400 V	
Type of coordination according to IEC 60947-4-1	1	
Power of three-phase motors at 400 V	Max. 5.5 kW	
Utilization categories	AC-1, AC-2, AC-3, AC-4	
Safe isolation between main and auxiliary conducting paths	400 V, according to DIN VDE 0106, Part 101	
Mechanical endurance of contactor	30 million operating cycles	
Electrical endurance of contactor	Up to 10 million operating cycles; depending on the current load (see manual)	
Permissible switching frequency	Depending on the current load, motor run time and relative ON time (see manual)	
Switching times at 0.85 to 1.1 x $U_e$		
• Closing delay	25 to 100 ms	
• Opening delay	7 to 10 ms	

# SIMATIC ET 200 distributed I/Os



## ET 200pro

### ET 200pro motor starters

#### Technical specifications (continued)

	Motor starter Standard DSe, RSe	Motor starter High Feature DSe, RSe
<b>Device functions</b>		
Parameterizable rated operating current	Yes	
Parameterizable current limit	No	Yes, 2 limit values
Parameterizable response to current limit violation	No	Yes
Zero-current monitoring	Yes	
Parameterizable response to zero-current violation	Yes	
Parameterizable current asymmetry limit	No, fixed limit (30 % $I_e$ )	Yes, 30 % to 60 % $\times I_e$
Parameterizable response to asymmetry limit violation	Yes	
Motor blocking monitoring	No	Yes
Parameterizable blocking current limit	No	Yes, 150 % to 1000 % $\times I_e$
Parameterizable blocking time limit	No	Yes, 1 to 5 s
Current value transmission	Yes	
General warning diagnostics	No	Yes, configurable
Group diagnostics	Yes, configurable	
Emergency start	Yes	
Digital inputs	No	Yes, 4 inputs
• Parameterizable input signal	No	Yes, latching/ non-latching
• Parameterizable input level	No	Yes, NC contact / NO contact
• Parameterizable input signal delay	No	Yes, 10 to 80 ms
• Parameterizable input signal lengthening	No	Yes, 0 to 200 ms
• Parameterizable input control actions	No	Yes, 12 different actions
400 V brake output	Yes, order option	
Parameterizable brake release delay	Yes, -2.5 to 2.5 s	
Parameterizable brake holding time on stopping	Yes, 0 to 25 s	
Local device interface	Yes	
Firmware update	Yes, by technical personnel	
Thermal motor model	Yes	
Parameterizable trip class	No, CLASS 10 fixed	Yes, CLASS 5, 10, 15, 20
Parameterizable response to thermal motor model overload	No	Yes, 3 possible states
Prewarning limit for motor heating	No	Yes, parameterizable 0 to 95 %
Prewarning limit - remaining time for tripping	No	Yes, parameterizable 0 to 500 s
Parameterizable recovery time	No	Yes, 1 to 30 min
Parameterizable protection against voltage failure	No, permanently integrated	Yes
Reversing starter function	Yes, order option	
Parameterizable lock-out time for reversing starters	No, 150 ms fixed	Yes, 0 to 60 s
Integrated logbook functions	Yes, 3 device logbooks	
Integrated statistical data memory	Yes	
Parameterizable response to CPU/Master STOP	Yes	
<b>Device indicators</b>		
• Group fault	SF LED (red)	
• Switching status	STATE LED (red, yellow, green)	
• Device status	DEVICE LED (red, yellow, green)	
• Digital inputs	No	IN 1 to IN 4, LED



Selection and Ordering data		Order No.
<p><b>Motor starter Standard</b> mechanical, Motor protection: Thermal model</p>  <p>DSe Standard</p>	<p><b>Direct starter Dse<sup>1)</sup></b></p> <ul style="list-style-type: none"> <li>• without brake output</li> <li>• with brake output 400 V AC</li> </ul> <p><b>Reversing starter RSe<sup>1)</sup></b></p> <ul style="list-style-type: none"> <li>• without brake output</li> <li>• with brake output 400 V AC</li> </ul>	<p>3RK1 304-5 S40-4AA0 3RK1 304-5 S40-4AA3</p> <p>3RK1 304-5 S40-5AA0 3RK1 304-5 S40-5AA3</p>
<p><b>Motor starter High Feature</b> mechanical, Motor protection: Thermal model</p>  <p>RSe High Feature</p>	<p><b>Direct starter Dse<sup>1)</sup></b></p> <ul style="list-style-type: none"> <li>• without brake output</li> <li>• with brake output 400 V AC</li> </ul> <p><b>Reversing starter RSe<sup>1)</sup></b></p> <ul style="list-style-type: none"> <li>• without brake output</li> <li>• with brake output 400 V AC</li> </ul> <p>Setting range for rated operating current</p> <ul style="list-style-type: none"> <li>• 0.15 ... 2.0 A</li> <li>• 1.5 ... 12.0 A</li> </ul>	<p>3RK1 304-5 S40-2AA0 3RK1 304-5 S40-2AA3</p> <p>3RK1 304-5 S40-3AA0 3RK1 304-5 S40-3AA3</p> <p>K L</p>

1) Functions only in combination with the backplane bus module and the wide rack. The backplane bus module and the wide rack must be ordered separately (see accessories for the ET 200pro motor starters).

# SIMATIC ET 200 distributed I/Os

## ET 200pro

### ET 200pro maintenance switch module

#### Overview

The maintenance switch module with integral group fusing function (i.e. additional group short-circuit protection for all externally supplied motor starters) is used due to its load disconnection function for safe isolation of the 400 V operating voltage while maintenance work is being undertaken in the plant.

All stations can be optionally fitted with a maintenance switch module depending on the power distribution concept.

The maintenance switch module is also available in a safety variant. See safety local maintenance switch module.

#### Benefits

The maintenance switch module boasts the following characteristics:



- Greater plant availability due to rapid replacement of devices (easy mounting and plug-in wiring)
- Cabinetless installation thanks to the high IP65 degree of protection

#### Technical specifications

	Maintenance switch module
<b>General data</b>	
Mounting dimensions (W x H x D) in mm	110 x 230 x 170
• Direct starter and reversing starter	
Permissible ambient temperature	-25 °C ... +55 °C -40 °C ... +70 °C
• in operation	
• During storage	
Permissible mounting position	Any
Vibration resistance in accordance with IEC 60068, Part 2-6	2 g
Shock resistance in accordance with IEC 60068, Part 2-27	Half-sine 15 g/11 ms
Current consumption	Approx. 20 mA
• From auxiliary circuit L+/M (U1)	
• From auxiliary circuit A1/A2 (U2)	–
Rated operating current for power bus $I_e$	25 A
Rated operating voltage $U_e$	400 V
Approval DIN VDE 0106, Part 101	up to 500 V
acc. to CSA and UL	up to 600 V
For conductor cross-sections	max. 6 x 4 mm <sup>2</sup>
• Power infeed	

	Maintenance switch module
Degree of protection	IP65
Touch protection	Safe against finger touch
Pollution degree	3, IEC 60664 (IEC 61131)
Rated impulse withstand voltage $U_{imp}$	6 kV
Rated insulation voltage $U_i$	400 V
Rated operating current for starter $I_e$	25 A 25 A
• AC-1/2/3 at 40 °C	
- at 400 V	
- at 500 V	
Rated short-circuit switching capacity	50 kA at 400 V
Type of coordination according to IEC 60947-4-1	2
Safe isolation between main and auxiliary conducting paths	400 V, according to DIN VDE 0106, Part 101
<b>Device functions</b>	
• Group diagnostics	Yes, configurable
<b>Device indicators</b>	
• Group fault	SF LED (red)

#### Selection and Ordering data

Version	Order No.
<b>ET 200pro maintenance switch module, mechanical</b>  <b>Maintenance switch module</b> <sup>1)</sup> Rated operating current 25 A	<b>3RK1 304-0HS00-6AA0</b>
 <b>Safety local maintenance switch module</b> <sup>1) 2)</sup> Rated operating current 25 A	<b>3RK1 304-0HS00-7AA0</b>

1) Functions only in combination with the backplane bus module and the wide rack. The backplane bus module and the wide rack must be ordered separately (see accessories for the ET 200pro motor starters).

2) The safety local maintenance switch module only operates when combined with the 400 V shutdown module.

#### Overview



#### **Safety local isolator module**

The safety local isolator module is a maintenance switch with integrated safety evaluation functions that can be parameterized over DIP switch.

It serves:

- the connection of a 1 or 2-channel EMERGENCY-STOP circuit up to Cat. 3-4/Sil3 (protective door or EMERGENCY-STOP buttons) and parameterizable start behavior
- to control 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 the operating voltage of 400 V up to Cat. 3-4/Sil3. It only functions in combination with the safety local isolator module.

#### Application

##### **Safety local isolator module**

The safety local isolator module features the same functions as a standard isolator module with an additional local safety function.

The safety local isolator module contains a 3TK28 41 module and is equipped with M12 terminals for the connection of external safety components.

Terminals 1 and 2 can be used to connect either 1-channel or 2-channel EMERGENCY-STOP circuits or protective door circuits (IN 1, IN 2).

For monitored starts, an external START switch can be connected to terminal 3.

The required safety functions can be set over 2 slide switches located under the left M12 opening.

In the event of an EMERGENCY-STOP, the safety local isolator module trips the downstream 400 V disconnecting module. This safely isolates the 400 V circuit up to CAT 4.

In combination with the 400 V disconnecting module, the safety local isolator module can be used for safety applications up to Category 4 to EN 954-1.

##### **400 V disconnecting module**

The 400 V disconnecting module can be used together with the safety local isolator module for local safety applications. It contains two contactors connected in series for safety-oriented tripping of the main circuit. The auxiliary circuit supply of the device is over a safety power rail in the backplane bus module.

In combination with the safety local isolator module, the 400 V disconnecting module can be used for safety applications up to Category 4 to EN 954-1.

# SIMATIC ET 200 distributed I/Os



## ET 200pro

### Safety local Module

#### Technical specifications

	Safety local isolator module	400 V disconnecting module
<b>General data</b>		
Mounting dimensions (W x H x D) in mm		
• Direct starter and reversing starter	110 x 230 x 170	110 x 230 x 150
Permissible ambient temperature		
• During operation	-25 °C ... +55 °C	
• During storage	-40 °C ... +70 °C	
Permissible mounting position	Any	
Vibration resistance to IEC 60068, Part 2-6	2 g	
Shock resistance to IEC 60068 Part 2-27	Half-sine 15 g/11 ms	
Current consumption		
• From auxiliary circuit L+/M (U1)	approx. 20 mA	
• From auxiliary circuit A1/A2 (U2)	--	
Rated operating current for power bus $I_e$	25 A	16 A
Rated operating voltage $U_e$	400 V	
Approval to DIN VDE 0106 Part 101	up to 500 V	
CSA and UL approval	up to 600 V	
For conductor cross-sections		
• Incoming energy supply	max. 6 x 4 mm <sup>2</sup>	
Degree of protection	IP65	
Touch protection	Finger-safe	
Degree of pollution	3, IEC 60664 (IEC 61131)	
Rated impulse withstand voltage $U_{imp}$	6 kV	
Rated insulation voltage $U_i$	400 V	
Rated operating current for starter $I_e$		
• AC-1/2/3 at 40 °C		
- At 400 V	25 A	16 A
- At 500 V	25 A	16 A
Rated short-circuit breaking capacity	50 kA at 400 V	
Type of coordination to IEC 60947-4-1	2	
Safe isolation between main and auxiliary conducting circuits	400 V, to DIN VDE 0106 Part 101	
Operating times at 0.85 ... 1.1 x $U_e$		
• Closed time	--	25 ... 100 ms
• Contact parting time	--	7 ... 10 ms
<b>Device functions</b>		
• Group diagnostics	Yes, parameterizable	
<b>Device indications</b>		
• Group fault	SF LED (red)	

#### Selection and Ordering data

	Version	Order No.
 <p data-bbox="129 314 496 346"><b>ET 200pro Safety Local Isolator Modules, mechanical</b></p> <p data-bbox="496 346 1139 378"><b>Safety local isolator module</b> <sup>1) 2)</sup></p> <p data-bbox="496 378 1139 410">Rated operating current 25 A</p>		<p data-bbox="1139 378 1460 410"><b>3RK1 304-0HS00-7AA0</b></p>
	<p data-bbox="496 597 1139 629"><b>400 V disconnecting module</b> <sup>1) 3)</sup></p> <p data-bbox="496 629 1139 661">Rated operating current 16 A</p>	<p data-bbox="1139 629 1460 661"><b>3RK1 304-0HS00-8AA0</b></p>

- 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 starter).
- 2) The safety local isolator module only functions when used together with the 400 V disconnecting module.
- 3) The 400 V disconnecting module only functions when used together with the safety local isolator module.

# SIMATIC ET 200 distributed I/Os

## ET 200pro

### Accessories for ET 200pro Motor Starter

Ordering data	Order No.		Order No.
<b>ET 200pro accessories</b>			
<b>Wide module rack<sup>1)</sup></b>			
• Length 500 mm	6ES7 194-4GB00-0AA0		
• Length 1000 mm	6ES7 194-4GB10-0AA0		
• Length 2000 mm	6ES7 194-4GB20-0AA0		
<b>Backplane bus module 110 mm<sup>2)</sup></b>	3RK1 922-2BA00		
<b>RS 232 interface cable</b>	3RK1 922-2BQ00		
<b>Power jumper plug</b>	3RK1 922-2BP00		
<b>Plug set for incoming energy supply (HAN Q4/2)</b>			
• 2.5 mm <sup>2</sup>	3RK1 911-2BE50		
• 4.0 mm <sup>2</sup>	3RK1 911-2BE10		
• 6.0 mm <sup>2</sup>	3RK1 911-2BE30		
<b>Plug set for motor connection (HAN Q8/0)</b> <sup>G</sup>			
• 1.5 mm <sup>2</sup>	3RK1 902-0CE00		
• 2.5 mm <sup>2</sup>	3RK1 902-0CC00		
		<b>Sealing cap (for power supply)</b> <sup>G</sup>	3RK1 902-0CJ00
		<b>Plug set for cable-end connector hood with pin inserts 4 mm<sup>2</sup></b>	3RK1 911-2BF10
		<b>Dismantling tool for HAN Q4/2</b>	3RK1 902-0AB00
		<b>Crimping tool for pins/sockets 4 and 6 mm<sup>2</sup></b>	3RK1 902-0CW00
		<b>Crimping tool for contact pins and sockets up to 4.0 mm<sup>2</sup> (HAN Q8/0)</b>	3RK1 902-0CT00
		<b>Dismantling tool for contact pins and sockets (HAN Q8/0)</b>	3RK1 902-0AJ00
		<b>M12 sealing cap</b>	3RX9 802-0AA00

G) Subject to export regulations: AL: N and ECCN: EAR99

- 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 modules (isolator module, safety local isolator module and 400 V disconnecting module).