

Overview



The fully modular connection for connecting to the digital I/O modules of the SIMATIC S7-1500 or ET 200MP consists of modified front connectors, called front connector modules, pre-assembled connecting cables of various lengths, and connection modules. Suitable components can be selected for the application in question and joined by means of simple plugs. The connection modules are used instead of conventional terminal blocks and act as the interface to the sensors and actuators.

Benefits

- Easy plugging in of front connector module, connecting cable and connection module
- Fast and low-cost wiring
- Supply voltage connectable to front connector module or connection module for digital and analog signals
- Reduction in wiring errors, clear control cabinet wiring
- Distribution of digital signals by byte or by double-byte
- Each component can be replaced individually.
- Every cable length can be configured without cutting, or pre-assembled cables can be used

Design

Front connector module

Modified front connectors, called front connector modules, are available for connecting to the module. These are plugged into the module to be wired instead of the front connector. The front connector modules are available in many different digital and analog versions. The connecting cables are plugged into these front connector modules.

Connecting cable

The connecting cable is available in two different versions.

As a pre-assembled 16-pole or 50-pole round cable (shielded or unshielded) up to a length of 10 m, or as a 16-pole round-sheath ribbon cable (with or without shield), which can be easily assembled by the user; or as 2 x 16-pole round-sheath ribbon cables (without shield).

When assembled, there are one or two insulation displacement connectors (female ribbon connectors) at both ends of the cable.

The round-sheath ribbon cable is assembled by the user with the aid of pliers (can be ordered separately). The cable transmits 8 or 2 x 8 channels over a distance of up to 30 m.

The connecting cable connects the front connector module with the connection module.

Connection module

The system has digital and analog connection modules for connecting the I/O signals. These are snapped onto the standard DIN rail. The connection modules with basic or signal functionality are available in 1-byte or 4-byte versions.

Connection modules are available for two different connection methods: with push-in or screw terminals. The potential can be fed in at the connection module or at the front connector module.

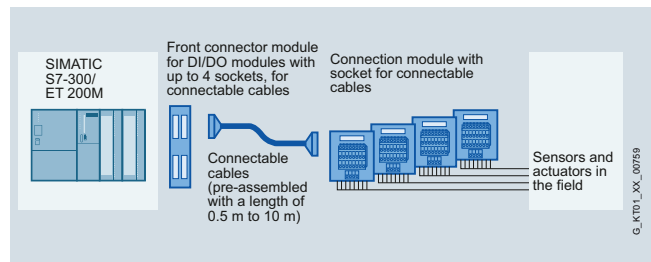
If other voltage or power levels are required in the field, the connection module for TPRo or TPOo output signals is used. For the TPRo connection module, relays are used for the implementation. For the TPOo connection module, optocouplers are used for the implementation. This converts the 24 V DC output signal simply and reliably to another voltage or power level. If 230 V AC or 110 V AC input signals have to be transmitted to the controller in the field, a connection module with relay TPRi is available that simply converts the 230/110 V AC signal to 24 V DC. This means that there is always the same voltage level on the module side.

Use with optocouplers for the TPRo relay modules

If higher switching frequencies of the relay connection module are required for the output signals, the relay can simply be replaced with an optocoupler (note technical specifications) in order to increase the switching frequency.

Shield plate

The shield plate is latched onto the connection module for 3-wire initiators or optionally onto the connection module for analog signals and then snapped onto the DIN rail with the connection module. With the shield connection clamps, optimal shield connection is achieved between the shielded round-sheath ribbon cable or the shielded field cables and the grounded DIN rail.



SIMATIC TOP connect for S7-300/ ET200 M, fully modular connection

SIMATIC S7-300 Advanced Controllers

I/O modules

Connection system

System cabling for SIMATIC S7-300/400 and ET 200M > Fully modular connection**Technical specifications front connector module**

| Technical data of front connector module | |
|--|--|
| Rated operating voltage | 24 VDC |
| Max. permissible operating voltage | 60 V DC |
| Max. permissible continuous current • per connector pin | 1 A |
| Max. permissible summation current | 4 A/byte |
| Permissible ambient temperature | 0 to + 60°C |
| Test voltage | 0.5 kV, 50 Hz, 60 sec. |
| Air gaps and creepage distances | IEC 664 (1980), IEC 664 A (1981), in accordance with DIN VDE 0110 (01.89), overvoltage class II, pollution degree 2 |

Wiring rules for front connector modules

| Front connector module SIMATIC TOP connect, connection for potential infeed | |
|---|---|
| Spring connection Screw connection | |
| Modules up to 4 connections | |
| Connectable cable cross-sections | |
| • solid cables | No |
| • flexible cables with/without wire end ferrule | 0,25 to 1.5 mm ² |
| Number of wires per connection | 1 or a combination of 2 conductors up to 1.5 mm ² (total) in a common wire end ferrule |
| Max. diameter of the cable insulation | 3.1 mm |
| Stripping length of the cables | |
| • without insulating collar | 6 mm |
| • with insulating collar | - |
| Wire-end ferrules in acc. with DIN 46228 | |
| • without insulating collar | Form A; 5 to 7 mm long |
| • with insulating collar 0.25 to 1.0 mm ² | - |
| • with insulating collar 1.5 mm ² | - |
| Blade width of the screwdriver | 3.5 mm (cylindrical shape) |
| Tightening torque for connecting the cables | - 0.4 to 0.7 Nm |

**Front connector module
SIMATIC TOP connect,
connection for potential infeed**

Spring connection Screw connection

Modules up to 8 connections

| | |
|--|---|
| Connectable cable cross-sections | |
| • solid cables | No |
| • flexible cables with/without wire end ferrule | 0.25 to 0.75 mm ² |
| Number of cables per connection | 1 or a combination of 2 wires up to 0.75 mm ² (total) in a common wire end ferrule |
| Max. diameter of the cable insulation | 2.0 mm |
| Stripping length of the cables | |
| • without insulating collar | 6 mm |
| • with insulating collar | - |
| Wire-end ferrules in acc. with DIN 46228 | |
| • without insulating collar | Form A; 5 to 7 mm long |
| • with insulating collar 0.25 to 1.0 mm ² | - |
| • with insulating collar 1.5 mm ² | - |
| Blade width of the screwdriver | 3.5 mm (cylindrical shape) |
| Tightening torque for connecting the cables | - 0.4 to 0.7 Nm |

Technical specifications connecting cable

| Technical specifications of connecting cable from SIMATIC S7 to connection module | |
|---|------------------|
| Operating voltage | 60 V DC |
| Continuous current per signal conductor | 1 A |
| Max. aggregate current | 4 A/byte |
| Operating temperature | 0 to +60 °C |
| Outer diameter of pre-assembled round cable in mm unshielded/shielded (16-pole) | Approx. 6.5/7.0 |
| Outer diameter of round-sheath ribbon cable in mm 16-pole/2 x 16-pole | approx. 9.5/11.5 |

Ordering data

Article No.

Article No.

Front connection modules

**Front connector module
(compact CPU 312C)**

Power supply via
• Screw terminals

6ES7921-3AK20-0AA0

**Front connector module
(compact CPU 313C/
314C-2PtP/314C-2DP), slot X1**

Power supply via
• Screw terminals

6ES7921-3AM20-0AA0

**Front connector module
(digital 2 x 8 I/O)**

Power supply via
• Spring-loaded terminals
• Screw terminals

6ES7921-3AA00-0AA0

6ES7921-3AB00-0AA0

**Front connector module
(digital 4 x 8 I/O)**

Power supply via
• Spring-loaded terminals
• Screw terminals

6ES7921-3AA20-0AA0

6ES7921-3AB20-0AA0

**Front connector module
(1 x 8 outputs)
for 2 ampere digital outputs**

Power supply via
• Spring-loaded terminals
• Screw terminals

6ES7921-3AC00-0AA0

6ES7921-3AD00-0AA0

**Front connector module 20-pin
(analog)**

Power supply via
• Spring-loaded terminals
• Screw terminals

6ES7921-3AF00-0AA0

6ES7921-3AG00-0AA0

**Front connector module 40-pin
(analog)**

Power supply via
• Spring-loaded terminals
• Screw terminals

6ES7921-3AF20-0AA0

6ES7921-3AG20-0AA0

Connecting cables

Pre-assembled round cable16-pin, 0.14 mm²

Unshielded

- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 2.5 m
- 3.0 m
- 4.0 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7923-0BA50-0CB0

6ES7923-0BB00-0CB0

6ES7923-0BB50-0CB0

6ES7923-0BC00-0CB0

6ES7923-0BC50-0CB0

6ES7923-0BD00-0CB0

6ES7923-0BE00-0CB0

6ES7923-0BF00-0CB0

6ES7923-0BG50-0CB0

6ES7923-0BJ00-0CB0

6ES7923-0CB00-0CB0

Shielded

- 1.0 m
- 2.0 m
- 2.5 m
- 3.0 m
- 4.0 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7923-0BB00-0DB0

6ES7923-0BC00-0DB0

6ES7923-0BC50-0DB0

6ES7923-0BD00-0DB0

6ES7923-0BE00-0DB0

6ES7923-0BF00-0DB0

6ES7923-0BG50-0DB0

6ES7923-0BJ00-0DB0

6ES7923-0CB00-0DB0

Version 4 x 16 to 1 x 50-pin,
0.14 mm²

Unshielded

- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 2.5 m
- 3.0 m
- 4.0 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7923-5BA50-0EB0

6ES7923-5BB00-0EB0

6ES7923-5BB50-0EB0

6ES7923-5BC00-0EB0

6ES7923-5BC50-0EB0

6ES7923-5BD00-0EB0

6ES7923-5BE00-0EB0

6ES7923-5BF00-0EB0

6ES7923-5BG50-0EB0

6ES7923-5BJ00-0EB0

6ES7923-5CB00-0EB0

Round-sheath ribbon cable16-pin, 0.14 mm²

Unshielded

- 30 m
- 60 m

6ES7923-0CD00-0AA0

6ES7923-0CG00-0AA0

Shielded

- 30 m
- 60 m

6ES7923-0CD00-0BA0

6ES7923-0CG00-0BA0

Round-sheath ribbon cable2 x 16-pin, 0.14 mm²

Unshielded

- 30 m
- 60 m

6ES7923-2CD00-0AA0

6ES7923-2CG00-0AA0

**Connector
(female ribbon connector)**

16-pin,
insulation displacement system,
with strain relief devices;
packing unit: 8 connectors
and 8 cable grips

6ES7921-3BE10-0AA0

Accessories**Manual pliers**

For preparing the connectors
(female ribbon connector)

6ES7928-0AA00-0AA0