SIEMENS

SIMATIC HMI

OP7, OP17 Operator Panel

Equipment Manual

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1.3 Design of Operator Panel OP7

OP7 versions

The OP7 has a plastic housing with a touch-sensitive front and is therefore suitable for ungrounded installation. The coloring of the front foil conforms with machinery directive EN 60204.

The OP7 is available in the following versions:

- OP7/PP,
- OP7/DP and
- OP7/DP-12.

The versions differ only in their communication options. figure 1-2 shows the design of Operator Panel OP7.

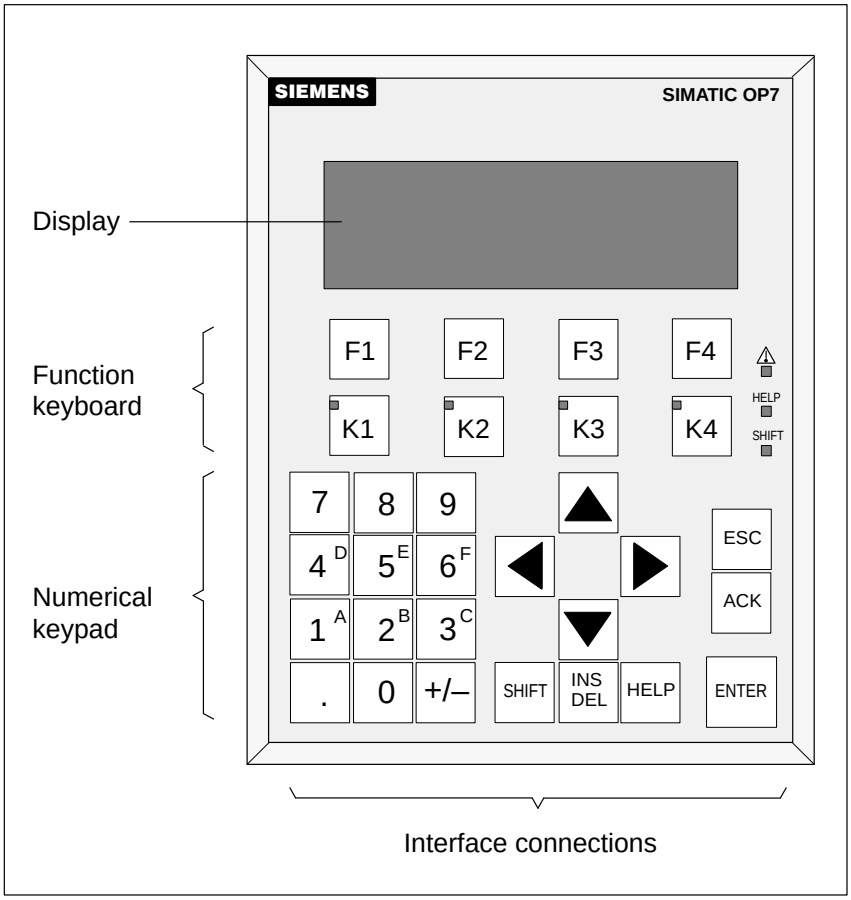


Figure 1-2 Design of Operator Panel OP7

Installation

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Mounting location and conditions

Operator Panels OP7 and OP17 are suitable for fitting into control cabinets and consoles.

Before you install an OP, you must cut out a section of the front panel (mounting cutout) (see chapter 16). The front panel must not be thicker than 6 mm. No other drilled holes are required for mounting.

You will find mounting depth details in chapter 16.

Make sure at the location where you plan to install the OP that there is a clearance of at least 50 mm beneath its housing to accommodate protruding connectors.



Caution

- The OP must be brought to room temperature before it is commissioned. In the event of moisture condensation, do not turn on the OP until it is absolutely dry.
- The OP was subjected to function testing before being supplied to you. Should a fault occur for all that, please enclose a precise description of the fault on returning the OP.
- To prevent the OP from overheating in operation,
  - the device must not be exposed to direct sunlight (this simultaneously prevents fading of the foil front) and
  - the ventilation slits in the device housing must remain free after mounting.
- On opening the panel, certain parts of the system become accessible that may conduct hazardous voltage.

Degree of protection

The IP65 degree of protection on the front panel can be insured only when the gasket on the front panel of the OP fits properly.

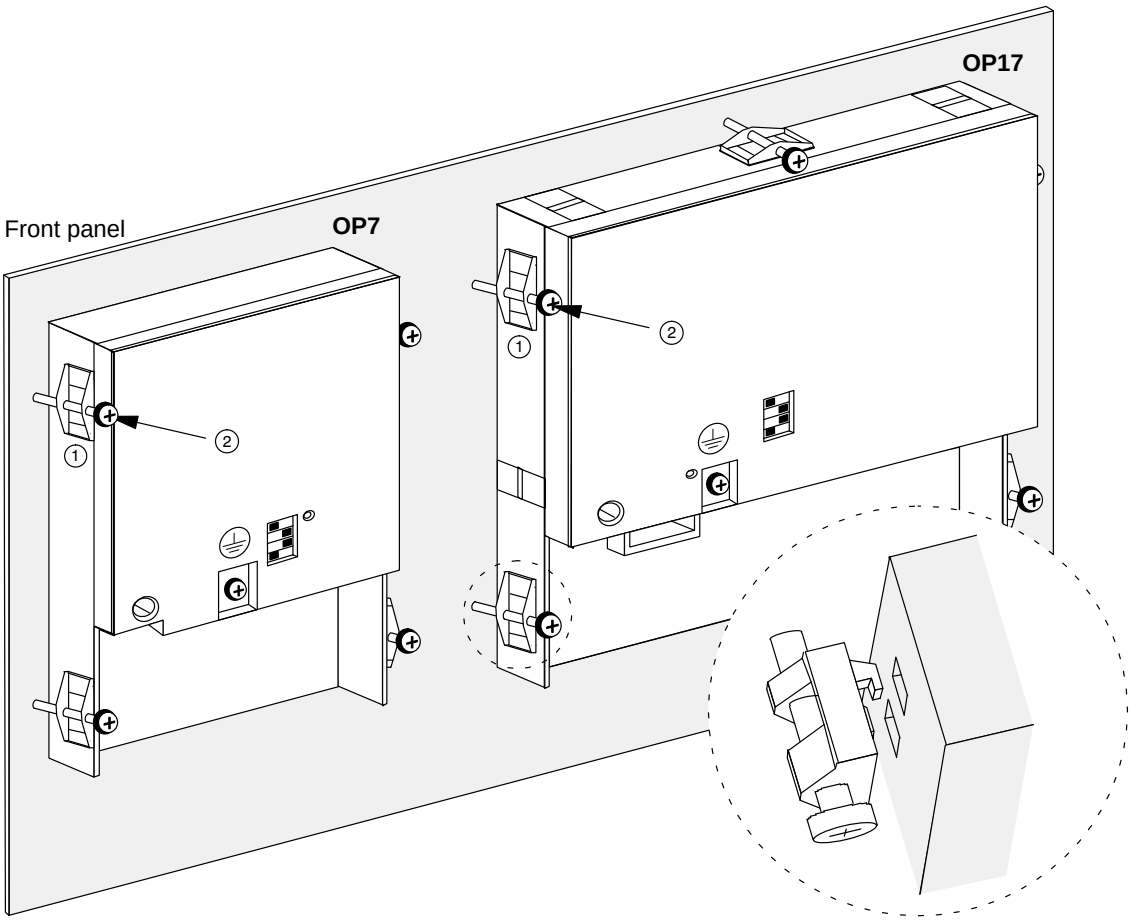
Prior to installation

Should you wish to modify the labels on the function keys, replace the labeling strips before you install the OP. You will find tips on how to replace labeling strips in section 16.3.

14.1 Mechanical Installation

Installing the OP

Step	Procedure
1	Push the enclosed gasket from the rear over the housing and insert the OP from the front in the prepared mounting cutout. Take suitable measures to prevent the OP from falling out of the front panel before it is finally fixed in position.
2	Insert the retaining hooks of the screw type clamps ① enclosed with the OP into the corresponding mounting locations in the housing of the OP. You require four screw type clamps for the OP7 and five for the OP17.
3	Tighten the OP from behind in the front panel using a screw-driver ②. Note: Make sure that the gasket fits properly on the front plate. Avoid excessively high torques.



14.2 Electrical Installation

Electrical connections

The OP requires the following electrical connections

- to the power supply,
- to the configuring computer (PC or programming unit),
- to the PLC.

The electrical connection to the configuration computer is required only to download the firmware and configuration.

Interference-proof hardware design

The basis for interference-free operation is interference-proof hardware design of the PLC in accordance with EMC guidelines and the use of interference-proof cables. The guidelines for interference-proof design of your PLCs also apply accordingly for installation of the OP.



Caution

- Use only shielded cable for all signal connections.
- Screw down or lock all plug connections.
- Do not install signal lines in the same cable ducts as high voltage lines.
- Siemens AG accepts no responsibility whatsoever for malfunctions and damage arising from the use of self-made cables or cables from other manufacturers.

Polarity reversal protection

The OPs have polarity reversal protection. This does not work if there is already a link to another unit via an RS232 interface. For this reason, always proceed as follows whenever commissioning the OP:

1. Connect the power supply.
2. Switch on the OP. If the OP does not run up, swap over the connections because their polarity is reversed.
3. Once the OP has run up, connect the configuration computer or I/O device.

14.2.1 Connecting the Power Supply

Terminal Block

There is a two-pin screw-type terminal on the lower side of the OP housing for connecting the power supply. The screw-type terminal is designed for cables having a cross-section not larger than 2.5 mm^2. The terminal screws are accessible via drill holes in the rear panel.

figure 14-1 shows the location of the screw-type terminals on the OP7 and OP17.

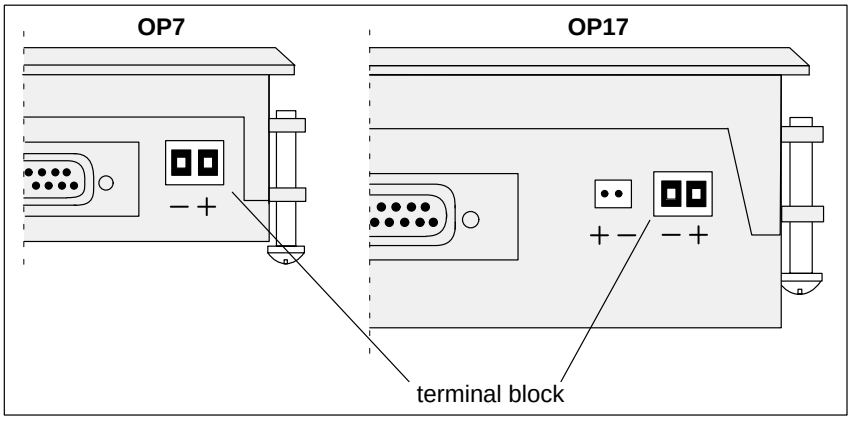


Figure 14-1 Connecting the Power Supply (View of Underside of OP)

Caution

- With a 24 V supply, make sure the extra-low voltage is isolated safely. Use only power supplies complying with ICE 364-4-41 or HD 384.04.41 (DE 0100. Part 410).
- The voltage supply must be within the permissible voltage range for the device in question (see chapter C), otherwise it is not possible to exclude the possibility of failures.

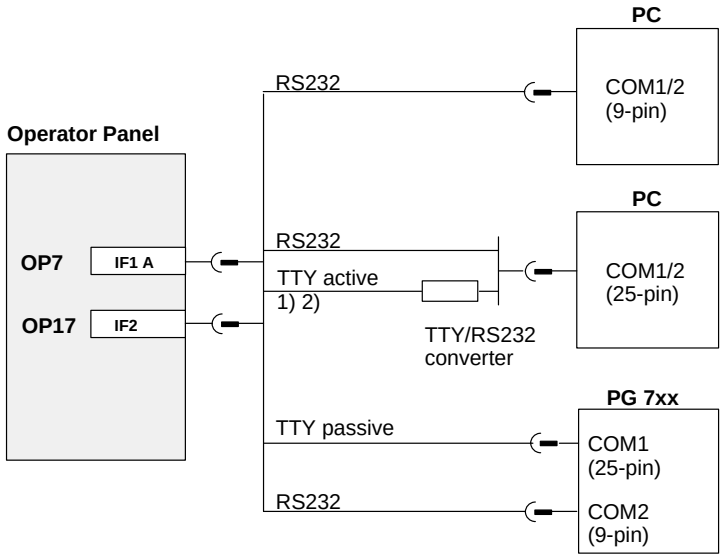
Chassis ground

Connect the chassis ground on the bottom of the device to the cabinet ground.

14.2.2 Connecting a Configuration Computer

Connection Configuration Scheme

Figure 14-2 shows you how to connect an OP7 and an OP17 temporarily to a configuration computer (PU or PC) for downloading the firmware and configuration data. Standard cables are available for the connections shown in the figure (refer to the ST80.1 catalog).



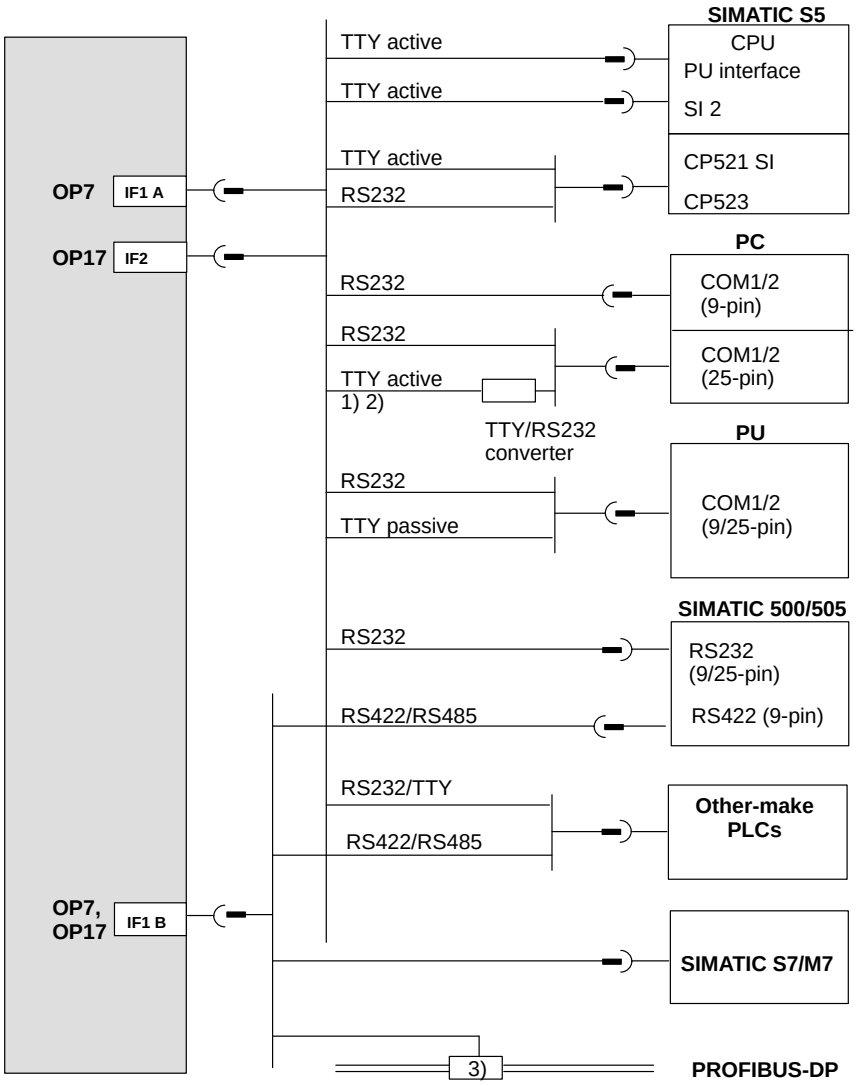
1) Not with OP7-DP and OP17
2) Do not use the converter cable from Siemens for connecting via TTY, since OP7-DP and OP17 do not supply 20 mA.

Figure 14-2 Connection Configuration Scheme for Configuration Computers

14.2.3 Connections to PLC

Connection Configuration Scheme

Figure 14-3 shows the basic options for connecting the OP to the PLC. For further details concerning the different OP versions please refer to Tables 16-1 and 16-2 in Chapter 16. Standard cables are available for the connections shown in the figure (refer to the ST80.1 catalog).



1) Not with OP7-DP and OP17-DP
2) Do not use the converter cable from Siemens for connecting via TTY, since OP7-DP and OP17-DP do not supply 20 mA.
3) Any PROFIBUS bus terminal (except FSK)

Figure 14-3 Connection Configuration Scheme for PLCs

Configuring interface IF1B

You can configure interface IF1B using the DIP switch at the rear of OP versions DP and DP-12. This involves changing over the RS422 receive data and the RTS signal. By default, the RTS signal is not required by the communicating peer.

The table shows the permissible settings for the DIP switch.

Communication via		Switch Position 1	2	3	4
RS422/RS485		OFF	ON	ON	OFF
PROFIBUS-DP	RTS at Pin 4 (default)	ON	OFF	OFF	OFF
	RTS at Pin 9 (as PG)	OFF	OFF	OFF	ON
	No RTS on connector	OFF	OFF	OFF	OFF

You will find the interface assignments of the different OP versions in appendix D of this manual.

Commissioning

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Diagrammatic representation

The commissioning guide which follows explains the different steps that have to be taken to commission the OP. Figure 15-1 shows the most important steps for initial commissioning, recommissioning and normal operation of the OP.

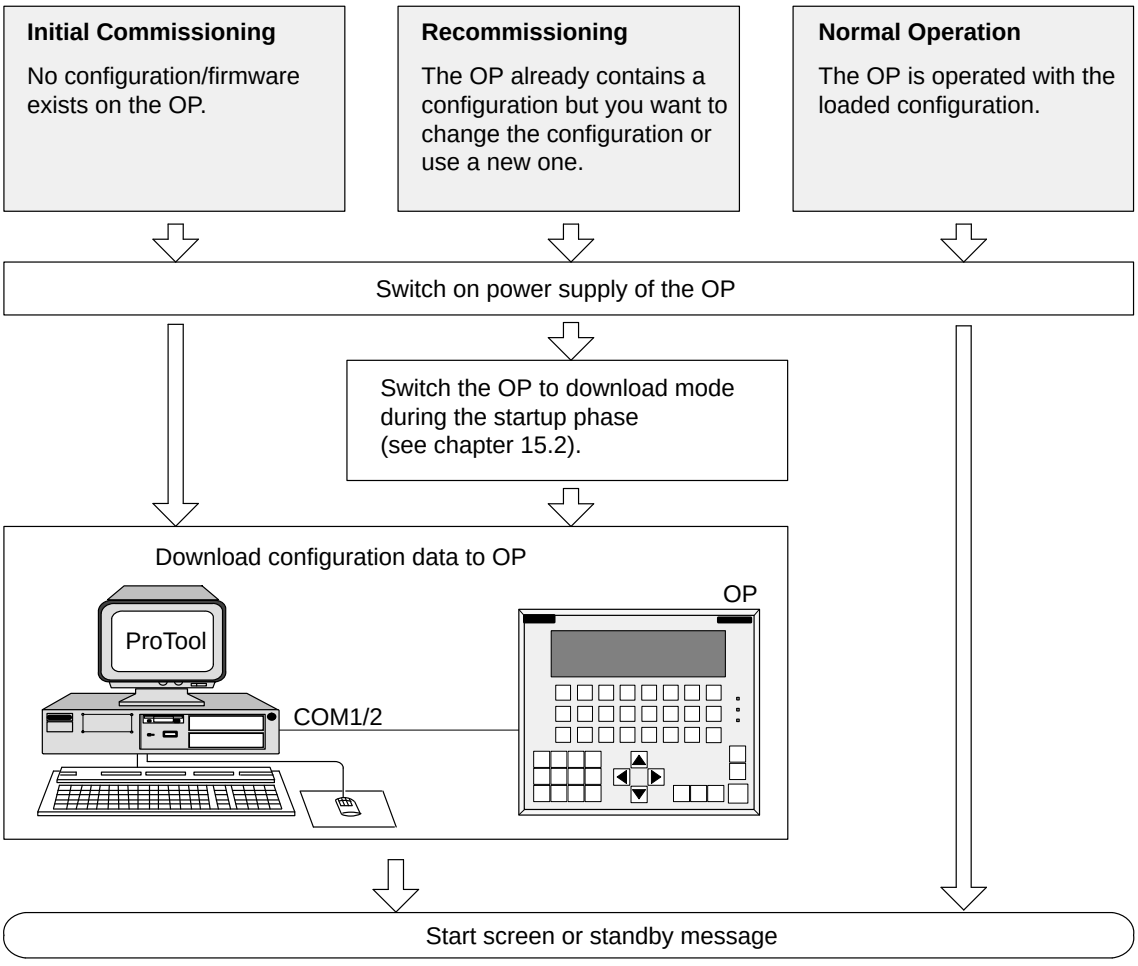


Figure 15-1 Commissioning Flowchart

15.1 Initial commissioning

Procedure

Initial commissioning comprises loading the firmware required to enable the OP to function and the configuration onto the OP. You do this as follows:

Step	Procedure
1	Switch on the OP's power supply. [1)] Since a configuration has not yet been loaded at this point in time, the OP automatically switches to download mode and waits for data to be downloaded from the configuration computer (PC/PU). You are not able to operate the OP in this mode.
2	Using a suitable standard cable, connect the configuration computer to the interface of the OP: • IF1A for OP7 • IF2 for OP17
3	Start the download operation to the OP on the PC or PU. The OP checks the link to the PC or PU. If a link is not available or if it is not functioning properly, the OP issues a corresponding error message. If the link is in order, downloading of the configuration from the PC or PU is initiated to the OP. As long as data are not being downloaded to the OP, you can cancel Download mode by pressing ESC

1) Switch on the power supply **before** you connect the OP to the configuration computer. If you don't, the internal polarity reversal protection function of the OP can be rendered ineffective is the polarity of the power supply is reversed.

Note

Please refer to the *ProTool/Lite User's Guide* for the ProTool settings required for downloading.

Once the configuration has been successfully downloaded, the OP runs up again. If a start screen has been defined in the configuration, it is opened. If a start screen has not been defined, the OP displays the standby message.

15.2 Recommissioning

Procedure

If you want to replace a configuration already loaded on the OP with another one, proceed as follows:

Step	Procedure
1	Using a suitable standard cable, connect the configuration computer (PU or PC) to the interface of the OP: • IF1A for OP7 • IF2 for OP17
2	Switch on the power supply of the OP.
3	There are two ways to switch the OP to download mode: • **While normal operation is in progress** By calling the standard screen *System settings* → *OpMode* → *Download*. If necessary, enter the password for the required password level beforehand. • **During the startup phase of the OP** When switching on the power supply of the OP, press these three keys at the same time. ESC + ▶ + ▼ This key combination (”overall reset”) deletes the configuration memory. The OP then switches to download mode and waits for data to be downloaded from the PC/PU.
4	Start the download operation to the OP on the PC or PU. The OP checks the link to the PC or PU. If a link is not available or if it is not functioning properly, the OP issues a corresponding error message. If the link is in order, downloading of the configuration from the PC or PU is initiated to the OP. In doing so, the present configuration on the OP is overwritten by the new one. As long as data are not being transferred between the PC/PU and the OP, you can cancel Download mode by pressing ESC

Once the configuration has been successfully downloaded, the OP runs up again. If a start screen has been defined in the configuration, it is opened. If a start screen has not been defined, the OP displays the standby message.

Fault diagnosis

Any fault occurring during commissioning or in operation is normally displayed by means of an error message on the display of the OP.

You will find an overview of the most important system messages together with notes on troubleshooting in an appendix to this manual.

Technical Data

C

Housing	OP7			OP17		
	PP	DP	DP-12	PP	DP	DP-12
Overall dimensions W x H x D	144 mm x 180 mm x 42.5 mm			240 mm x 204 mm x 54 mm		
Mounting cutout B x H	135 mm x 171 mm			231 mm x 195 mm		
Mounting depth	38.5 mm			50 mm		
Degree of protection – front – rear	IP65 IP20					
Weight approx.	0.430 kg			0.960 kg		

Memory	OP7			OP17		
	PP	DP	DP-12	PP	DP	DP-12
Flash memory for configuration data and data records	128 kbytes			256 kbytes		

Display	OP7			OP17		
	PP	DP	DP-12	PP	DP	DP-12
Type	LCD with LED backlighting					
Number of lines	4			4 or 8 (configurable)		
Characters per line	20			20 or 40 (depending on number of lines)		
Font size	8 mm			11 mm or 6 mm (depending on number of lines)		

Interfaces	OP7			OP17		
	PP	**DP**	**DP-12**	**PP**	**DP**	**DP-12**
RS232	1	1	1	2	2	2
TTY	1	–	1	2	1	2
RS422/485	1	–	1	1	–	1
PPI/MPI/ PROFIBUS-DP (up to 1.5 Mbd)/ RS422/485	–	1	1	–	1	1
PPI/MPI/ PROFIBUS-DP (up to 12 Mbd)/ RS422/485	–	–	1	–	–	1

Ambient conditions	OP7			OP17		
	PP	**DP**	**DP-12**	**PP**	**DP**	**DP-12**
Operating temperature						
– vertical installation	0 °C ... 50 °C					
– horizontal installation	0 °C ... 35 °C					
Transportation, storage	–25 °C ... 70 °C					
Relative humidity						
– operation	≤ 95% no dew					
– transportation, storage	≤ 95%					
Shock resistance						
– operation	5 g/11 ms					
– transportation, storage	25 g/6 ms					
Vibration						
– operation	0.075 mm (10 Hz ... 58 Hz) 1 g (58 Hz ... 500 Hz)					
– transportation, storage	3.5 mm (5 Hz ... 12 Hz) 1 g (12 Hz ... 500 Hz)					
Max. pressure difference (front, rear)	2 hPa					
Air pressure						
– operation	706 ... 1030 hPa					
– transportation, storage	581 ... 1030 hPa					

Interface Assignment

D

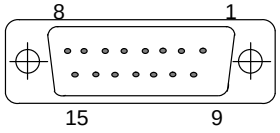
Overview

Table D-1 shows the interface configuration of the different OPs. Entries D-2 to D-5 refer to the corresponding pin assignments in Tables D-2 to D-5.

Table D-1 Interface assignment OP7 and OP17

Interface	OP version					
	OP7 PP	OP7 DP	OP7 DP-12	OP17 PP	OP17 DP	OP17 DP-12
IF1A	D-2	D-2	D-2	D-2	D-2	D-2
IF1B	D-3	D-4	D-5	D-3	D-4	D-5
IF2	–	–	–	D-2	D-2	D-2

Table D-2 Pin assignment 15-pin sub-D socket



Pin	General	RS232	TTY
1	n.c.		
2			RxD–
3		RxD	
4		TxD	
5		CTS	
6			TxD+
7			TxD–
8	n.c.		
9			RxD+
10		RTS	
11			+20 mA[1)]
12	GND		
13			+20 mA[1)]
14	+5 V		
15	GND		

1) Not with IF2