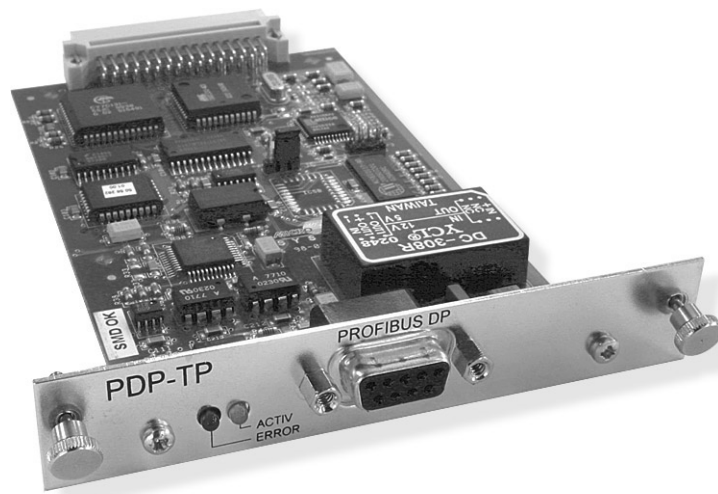


# PDP-TP

## Communication module



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## 1 INTRODUCTION

This documentation is designed as a reference for connecting, commissioning and operating the PDP-TP communication card.

This can only be used in MICRO PANEL devices which are provided with an appropriate slot (target hardware).

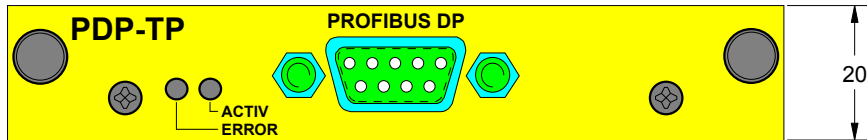
The card must only be fitted and removed when the device is in a de-energized state.

The PDP-TP card supports the Profibus DP protocol and functions solely as a class B slave. This development is based on the EN50170 standard.

2 LED elements

## 2 LED ELEMENTS

### FRONT PANEL



ERROR	When this ERROR LED (red) is lit, the last data transmission to the PLC could not be executed correctly. The LED will not go out until the next data transmission with the PLC was carried out correctly. This LED should never be lit in normal operation.
ACTIV	Green LED, lit during active data transmission between the PDP-TP and the PLC. In normal operation, this LED should flash <b>momentarily (approx. 50 ms)</b> with every data transmission.

### 3 CONNECTOR ASSIGNMENT

The plug connector (Sub-D 9pole plug connector, female) and the connector assignment comply with the Profibus standard (EN50170). Only the mandatory signals and the power supply for line termination are provided.

PROFIBUS DP		
Sub-D 9 pole female		
Pin No.	Assignment	
1	---	---
2	---	---
3	<b>RxD/TxD-P</b>	Receive/Transmit-Data-P
4	<b>CNTR-P</b>	Control-P (Rep. Control)
5	<b>DGND</b>	Data Ground (Termination)
6	<b>VP</b>	Voltage-Plus (Termination)
7	---	---
8	<b>RxD/TxD-N</b>	Receive/Transmit-Data-N
9	---	---
Case	Shield	

The power supply terminals Data Ground (0V, Pin 5) and Voltage-Plus (+5V, Pin 6) are used for the power supply of the cable termination and must not be used for anything else. The Control-P (Pin 4) signal is used in conjunction with a repeater. Data is transferred via both the Rxd/Txd-P (Profibus → B/B' / RS-485 → non-inverted I/O) and Rxd/TxD-N (Profibus → A/A' / RS-485 → inverted I/O) terminals.

## 4 Preparation of the Profibus cable (bus cable)

### 4 PREPARATION OF THE PROFIBUS CABLE (BUS CABLE)

The preparation of the bus cabling on the Profibus network is an essential factor in ensuring reliable operation and electromagnetic compatibility (EMC) on both the Profibus card and the target hardware.

**The EMC values (immunity and emission) specified in the technical data of the target hardware can only be guaranteed if the following cable preparation is completed.**

The Profibus cable (topology, cable, connectors, termination) must be prepared in compliance with the Profibus standard (EN50170).

#### 4.1 PROFIBUS TOPOLOGY

A Profibus network must be configured as a **linear** topology through all bus stations, and must be terminated at both ends. Branches and spur lines are not permitted. A bus segment can connect up to 32 bus stations with each other. Several bus segments can be linked by means of repeaters (bidirectional amplifiers).

#### 4.2 BUS CABLE

Data is transferred in the Profibus network via shielded twisted pair cables. Only use type A cables as specified in the Profibus standard (EN50170).

Rated ripple resistance: 150 Ohm (135...165 Ohm)

Capacitance per unit length: < 30 pF/m

Loop resistance: > 110 Ohm/km

Core cross section:  $\geq 0.34 \text{ mm}^2$  (22 AWG)

#### 4.3 CABLE LENGTHS

The physical interface of the Profibus is based on the EIA RS 485 standard (differential voltage transmission). The corresponding cable length limits and wiring recommendations apply.

The following lengths for a bus segment apply to cables in compliance with the Profibus standard (EN50170) for cable type A.

Baud rate in Kbit/s	Length in m
9.6	1200
19.2	1200
93.75	1200
187.5	1000
500	400
1500	200
12000	100

Non-observation of these limits may cause transmission errors.

### 4.4 SHIELD CONNECTION / POTENTIAL EQUALISATION

Shielded twisted pair cables are used for the Profibus network. The braided shield must have as low an impedance as possible to the shield reference potential at **each** bus station.

The connection between the cable shield and the shield reference potential (on the Micro Panel this is the metallic housing) must be implemented via the plug casing and the fixing screws of the Sub-D plug connector.

The shield reference potential of the individual bus stations is usually connected with the protective conductor system. This may therefore cause potential differences which in turn may give rise to equalisation currents along the cable shield. A potential equalisation bar should be provided if the potential differences and compensation currents between the shield reference potentials are high.

### 4.5 BUS PLUG CONNECTOR

Only use bus plug connectors that are specified for use in the Profibus network. These connect both bus cables on a bus station and ensure that the cable shield is looped through with a low-impedance connection and connected to the shield reference potential of the bus station.

These bus plug connectors contain the special Profibus cable termination that can be activated with a slide switch if required. Components are also integrated for compensating the capacitive load of the bus station as is required for bit rates over 1.5 Mbit.

Recommended bus plug connector:

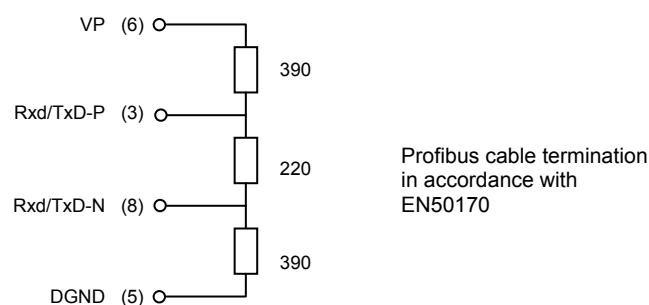
Manufacturer: Siemens

Designation: Bus plug connector for Profibus

Order No.: 6ES7 972-0BA10-0XA0 (Siemens)

### 4.6 LINE TERMINATION

The Profibus bus must be provided with line termination at both ends in compliance with the Profibus standard. The termination is passive but is supplied from the bus station, and ensures a defined idle signal on the bus when there are no bus stations active (all bus stations are tri-state).



**The bus segment must be terminated at both ends!**

**No more than 2 bus terminations must be activated for each bus segment!**

**At least one of the two bus terminations must be fed by the bus station!**

Operation without the correct bus termination of the Profibus network may cause transmission errors.

## 5 FIRMWARE

The firmware PDP-TP.BIN is loaded on a retentive (Flash) memory on the PDP-TP.

The latest Profibus driver is loaded at the factory when the card is shipped. The driver can be updated at any time via a MICRO PANEL (see relevant documentation of the MICRO PANEL).

**J6 - PRG RUN**  
The Profibus driver is started when in position RUN.  
A new driver can be loaded when in position PRG.

