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About this "Installation manual"

Please read this manual carefully, prior to installation. It facilitates assembly and setup of your system and provides you with important information.

Intended use
The device is designed to be used as an interface between PROFIBUS and Ethernet networks. Any other use is deemed non-intended use.

Explanation of the safety instructions
The following symbols and signal words used are intended to draw your attention to special situations:

- **Danger**
  Warning of personal injury from voltage.

- **Warning**
  Warning of damage to device.

- **Note**
  Useful tips.

- **Disposal**
  Notes on disposal.

Menu and keyboard commands
The following conventions apply to menu and keyboard commands:

- **Courier font**
  Window names, menu items, fields and descriptions of combo boxes, check boxes, radio buttons and icons.

- **<Key>**
  Press the indicated key.
For your safety

Strictly observe the following safety instructions before connecting the device:

- Carefully plan the integration of the device into an existing system and ensure a proper function of the system after installation.
- The device may only be assembled or disassembled by qualified, trained electrical engineering personnel. When installing the device, observe the regulations for handling electric components in accordance with VDE 0100. In addition, you must also observe the valid safety and accident prevention regulations (UVV) when operating the device within the jurisdiction of the Federal Republic of Germany.
- Observe the EN 61158 PROFIBUS norm.
- Always install the device on a suitable DIN-rail (mounting rail).
- Cables used for the connection must not apply any mechanical forces to the device.
- High temperature differences between the storage site and installation site can result in condensation within the case, which may cause the device to become damaged. In case of high temperature differences, please wait at least three hours before operating the device.
- Lock the connected plug (PROFIBUS) using the screw connections intended for this purpose.

Warning

Never open the case of the device or carry out any mechanical modifications on the device. Otherwise, this may lead to damages on the device as well as to loss of warranty.

Warning

The device contains electronic components sensitive to electrostatic discharges. Damages due to electrostatic discharge can lead to premature failure of components or intermittent faults at a later stage. Before installing the device, divert the electrostatic discharge away from your body and the tools used.

Warning

Small objects or liquids must not enter the case of the device (e.g. through the ventilation slots). This may damage the device. Never cover the ventilation slots on the device.
Disposal
The device must be disposed of separately from normal household waste in accordance with the 2002/96/EC (WEEE) Directive.
Performance and functioning

The Ethernet-PROFIBUS-Interface (PB-XEPI) as a compact gateway enables an easy connection of PROFIBUS networks to the Ethernet.

PB-XEPI features

– Supports 2 operation modes:
  – integrated PROFIBUS diagnosis of the entire PROFIBUS network with alert via email and PROFIBUS network access for other applications like PROFIBUS Scope from Trebing & Himstedt, TH OPC Server DP from Trebing & Himstedt, FDT frame application with CommdTM PROFIBUS DP-V1 from Trebing & Himstedt or Emerson’s AMS® Suite
  – Supports leading technologies such as FDT, EDD (Emerson’s AMS® Suite), OPC
  – Supports central field device configuration, calibration and diagnosis, e.g. via configuration tools such as FieldCare of Endress + Hauser, FieldMate from Yokogawa, PACTware™ or Emerson’s AMS® Suite
  – Independent of process control system or PLC manufacturers
  – Supports condition monitoring
  – Support smart-devices asset management

Scope of delivery

– Ethernet-PROFIBUS-Interface PB-XEPI
– Documentation

PB-XEPI Configuration requirements (not included in the scope of delivery)

– PC or notebook with Windows® 2000, XP or Server 2003 (operating system dependent on the application software used)
– Web browser (MS Internet Explorer® 6 or 7) for configuration of Ethernet and PROFIBUS diagnosis
– Application software for PROFIBUS configuration
– Enabling the ports 80 and 2364

Ethernet network presettings

– The device is preset to Ethernet network operation with a DHCP server. No Ethernet configuration settings are required in this operating mode.
– In case of manual allocation of IP addresses the device has the following standard IP: configuration:

  | IP address   | 169.254.0.1 |
  | Subnet mask  | 255.255.0.0 |
  | Standard gateway | 0.0.0.0 |
Design of the device

(see Fig. 1)

1 Ethernet interface  
2 LED ETH  
3 LED RUN  
4 LED PB

5 PROFIBUS interface  
6 Terminal strip for power supply  
7 Type label  
8 DIN-rail (not included in the scope of delivery)

Fig. 1: PB-XEPI (front and side view)
Connections and indicating elements

[1] Ethernet interface: RJ45 (10Base-T/100Base-TX)
   – LED lights yellow: Ethernet data communication
   – LED lights green: physical connection available

[2] LED ETH
   – ETH lights red: first start phase
   – ETH flashes red: boot procedure
   – ETH lights red or flashes red or green in case of an error: internal failure of the firmware.
   – ETH lights green: connection to application via Ethernet

[3] LED RUN
   – RUN lights red: internal failure identified
   – RUN lights green: 24 V power supply is fed

[4] LED PB
   – PB lights or flashes green: device communicates via PROFIBUS

[5] PROFIBUS interface: D-Sub socket

[6] Terminal strip for +24 VDC power supply
   – A: 24 V (+)
   – B: 0 V (-)
   – C: not assigned
   – D: Earth conductor

Mounting
   – 35 mm DIN rail [8] (not included in the scope of delivery)
Start-up guideline

The following steps are required for start-up:

1. Mount the device (see »Assembling the device« on page 12).
2. Connect to the Ethernet (see »Connecting the Ethernet« on page 12).
3. Connect to the power supply (see »Connecting the power supply« on page 13)
4. Configure the Ethernet (see »Configuring the device in the Ethernet network« on page 14).

5. Connect the PROFIBUS (see »Connecting the PROFIBUS« on page 18).
6. If you use the PB-XEPI in the PROFIBUS network access operation mode you have to configure PROFIBUS parameters of the device using an application software (not included in the scope of delivery).

**Note**
To set the IP address manually you must connect your computer to the device via a patch cable.

**Note regarding the application software**
An application software with the appropriate drivers is required for operating the device. The COM-DTM for usage of the PB-XEPI in FDT frame applications is on the CD.
Assembling and disassembling the device

**Warning**
Warning of damage to device. Above and below the device, a minimum of 5 cm head space for heat dissipation needs to be available.

![Diagram of device assembly and disassembly](image)

**Fig. 2: Assembly and disassembly of the device**
1. Device with notch on DIN rail
2. DIN rail
3. Device on DIN rail
4. Stop lever

Assembling the device
1. Place the notch of the device on the DIN rail and move the device downward until the stop lever locks into place on the DIN rail.

Disassembling the device
1. Disassemble the connected supply and signal lines (Ethernet, PROFIBUS, voltage).
2. Place the screwdriver into the stop lever on the device (see Fig. 2, [3]).
3. Press the screwdriver in the direction of the device and simultaneously swing the device off the DIN rail.

Connecting the Ethernet
1. Insert the patch cable plug (RJ45, not included in the scope of delivery) into the Ethernet socket on the device until the plug locks into place.
2. The green LED on the Ethernet socket lights as soon as the device is energized and an Ethernet network is available.
Connecting the power supply

**Danger**
Electrical voltage.
Only a qualified electrician is allowed to work on the device’s electrical equipment.
Incorrect device earthing can cause injury to personnel or device damage.
Ensure correct and proper earthing of the device.

**Warning**
Reverse polarity in the power supply can damage the device. Make sure the power supply is connected with correct polarity.

![Terminal strip for power supply on the device](image)

**Fig. 3: Terminal strip for power supply on the device**

1. Connect the cable of a 24 V power supply and the earth conductor (earth terminal) to the terminal strip on the device. The terminal strip can be plugged and lifted out using a screwdriver for installation.
2. Switch on the power supply. The LED RUN flashes green until the device’s initiation procedure is completed. Afterwards the LED RUN lights green.
Configuring the device in the Ethernet network

There are two connecting options to choose from, depending on your Ethernet network:

– Ethernet network with DHCP server – automatic and dynamic allocation of IP addresses (connection with patch cable via hub or switch)
– Ethernet network (Peer-to-Peer) – manual allocation of IP addresses (connection via patch cable)

Connection in a network with DHCP
(Dynamic Host Configuration Protocol)

The device is preset to Ethernet network operation with a DHCP server and in this case it is automatically assigned an IP address. This operation mode does not require configuration settings.

Note
If you connect the Ethernet with the power supply already connected, the DHCP may fail to be identified. The routine for the DHCP identification only runs during device start-up. Briefly switch off the power supply for a new DHCP identification.
Connection in a network with manual IP assignment

If you use the device in an Ethernet network without DHCP server, you need the following for configuration:

- TCP/IP settings for this network.
- A PC/notebook with a web browser.
- A patch cable between PC/notebook and device (peer-to-peer connection).

**Note**  
The computer must be in the same network as the device.

**Note**  
Always notify your system administrator prior to allocating IP addresses. If you set an address already assigned, other devices in the network may be deactivated and communication may be affected.

The device has the following manual default IP addresses (default settings at the time of delivery):

<table>
<thead>
<tr>
<th>IP address</th>
<th>169.254.0.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subnet Mask</td>
<td>255.255.0.0</td>
</tr>
<tr>
<td>Standard gateway</td>
<td>0.0.0.0</td>
</tr>
</tbody>
</table>
Determining the network addresses

Ask your system administrator for the IP addresses or do the following:

1. Connect your PC/notebook to the Ethernet network into which the device is to be integrated.
2. Start the MS-DOS prompt.
3. Enter `ipconfig -all`. All settings for your network are displayed. Note down the settings for subnet mask and standard gateway.

Setting the new IP and network addresses

1. Connect a patch cable to the device.
2. Connect a PC/notebook to the patch cable.
3. Start a Web browser on your PC/notebook (MS Internet Explorer 6 or 7).
4. Enter the IP address `http://169.254.0.1` and press <Enter>. The PB-XEPI website loads. A pop-up window opens. Please read the information carefully and close the window after that.
5. Then click the Settings tab. Information on the device is displayed in the web browser.

Fig. 4: Setting the IP and network addresses
Determining the network addresses

6. Select as user Admin to login as an administrator. The default password is the six-figure serial number of the device.
   We recommend to change the password after login. Click on Change and enter the new password. Repeat the password and click Apply.
7. Select Manual in the Network configuration.
8. Enter the new IP address into the text field.
9. Enter the new addresses for Subnet mask and Default gateway into the text fields.
10. Note down the set IP address.
11. If you do not want to use a DNS-Server, select No, otherwise enter the IP addresses.
   Click on the diskette to save the settings. The device restarts after this.

Checking the Ethernet connection to the device

Note
The device saves your settings. You can only access the configuration page of the device and modify settings using these addresses. After manual TCP/IP configuration settings, the device always starts with the latest saved configuration - even if the power supply was switched off for a short time.

You can check the device in the Ethernet network, if:
– The device is integrated into the Ethernet network
– The device is energized
– The PC/notebook is in the same Ethernet network.

Procedure
Start a web browser on your PC/notebook (e.g. MS Internet Explorer®).
– Via DHCP: Enter the default host name (consisting of Turck_+serial number) found on the device's type label (e.g.: Turck_000915) and press <Enter>.
– Manual IP configuration: Enter the set IP address (basic setting: 169.254.0.1) and press <Enter>.
Information on the PROFIBUS network is displayed in the web browser.
Connecting the PROFIBUS

The 9-pin D-Sub socket is used for connection.

- Only use standard PROFIBUS plugs and cards.
- Wire the PROFIBUS plug according to the details for pin assignment (see Technical data on page 23).
- If the device is installed at the beginning or end of the PROFIBUS cable segment, you will need a bus terminating resistor (see page 19).

**Warning!**

Do not use branch lines for the connection.
If local conditions do not allow a direct connection, use a repeater (connection according to PROFIBUS norm).

1. Attach the PROFIBUS connector onto the PROFIBUS socket on the device.
2. Secure the plug with screws.
3. Switch the switch for the bus terminating resistor on the PROFIBUS connector to the required position (ON/OFF).

![Diagram of PROFIBUS connection](image_url)

**Fig. 5: Possibilities for interface connection in the PROFIBUS network**

1. Connection at end/start of bus with terminating resistor
2. Connection in the middle of the PROFIBUS segment 1
3. Connection in a separate PROFIBUS segment behind a repeater.
Bus terminating resistors

Terminations of a PROFIBUS network must each be terminated with a bus terminating resistor. Use standardized plugs containing terminating resistors.

Fig. 6: Bus termination configuration for PROFINET (see PROFIBUS standard IEC 61158)

1 390 Ω Pull-up resistance from pin 3 to positive supply voltage at pin 6
2 220 Ω Cable terminating resistor between pin 3 and pin 8
3 390 Ω Pull-down resistance from pin 8 to data reference potential at pin 5

Warning
The PROFINET is shorted if you use the device as a passive terminating resistor (supply voltage from the device) and the device is switched off. This may cause disruption or complete failure of PROFINET communication. Use active resistors to avoid this problem. In this case the terminating resistors are fed with +5 V and GND independently from the device.

Setting PROFINET parameters
Depending on the application software (not included in the scope of delivery) used, the device can be a passive station (without an own station address) or an active station (class 2 PROFINET master).

The setting of the PROFINET parameters is only required, if you use the device as a class 2 PROFINET master or in the operation mode PROFINET network access. The PROFINET parameters are given by the class 1 PROFINET master.
PB-XEPI operation modes

PB-XEPI operation modes

PROFIBUS Diagnosis

The default setting at delivery of the device is the PROFIBUS diagnosis mode. It enables monitoring of the entire PROFIBUS network. You can configure the monitoring setup.

Proceed equally to “Checking the Ethernet connection to the device” (see »Procedure« on page 17).

Click on the Settings tab and login as an administrator. Select Admin as user and enter the password (Default is the six-figure serial number of the device). Select View - PROFIBUS diagnosis. Here you can configure the settings of Measurement, Alert and Time Server. If you need help, click on the question mark.

![Fig. 7: PROFIBUS diagnosis settings](image)
The PROFIBUS network access operation mode enables use of the PB-XEPI for other applications (PROFIBUS Scope from Trebing & Himstedt, TH OPC Server DP from Trebing & Himstedt, FDT frame application with CommDTM PROFIBUS DP-V1 from Trebing & Himstedt or Emerson’s AMS® Suite).

Proceed as shown in Checking the Ethernet connection to the device (see »Procedure« on page 17).

Click on the Settings tab and log in as an administrator. Select Admin as user and enter the password (default is the six-figure serial number of the device). Select View - PROFIBUS diagnosis. Click on Stop to stop the measurement. Change the view to PB-XEPI. Then select PROFIBUS network access as operation mode and save your settings by clicking on the diskette.

Fig. 8: Settings PROFIBUS network access
Troubleshooting

Troubleshooting

**Device is not found in the Ethernet network**

- Check the power supply (LED RUN must light green).
- Check for correct connection (RJ-45, see page 12).
- The device is preset to Ethernet network operation with a DHCP server (IP address for the device is assigned by the DHCP server). If your network server does not support DHCP, you need to set the IP address for the device yourself (see »Connection in a network with manual IP assignment« on page 15).
- When a patch cable is used between PC/notebook and device, both devices must be in the same network.

**PROFIBUS network is not found**

PB-XEPI as passive station:

- Check for proper connection (see »Connecting the PROFIBUS« on page 18) and switch at **Settings - PROFIBUS diagnosis - Measurement** the baud rate on **Automatic detection**.

PB-XEPI as active station (PROFIBUS network access):

- Check the PROFIBUS parameters for the channel used (see application software, not included in the scope of delivery). Each station has its own station address, which can only be assigned once in the network.

**LED ETH lights red or flashes red or green in case of failure or LED RUN lights red – internal error**

- Internal error or defect: Please contact Technical Support.
## Technical data

### Electrical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal supply voltage</td>
<td>VDC 24 (19.2...28.8)</td>
</tr>
<tr>
<td>Current consumption max.</td>
<td>mA 190</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP 20</td>
</tr>
</tbody>
</table>

### Operating conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature range</td>
<td>°C 0…+50</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>% 20...80 (no condensation)</td>
</tr>
</tbody>
</table>

### Case data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions W × H × D</td>
<td>mm 22.5 × 99 × 114.5</td>
</tr>
<tr>
<td>Weight (approx.)</td>
<td>g 120</td>
</tr>
</tbody>
</table>

### PROFINET interface

<table>
<thead>
<tr>
<th>Sub-D plug pin assignment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 1</td>
<td>not assigned</td>
</tr>
<tr>
<td>Pin 2</td>
<td>not assigned</td>
</tr>
<tr>
<td>Pin 3</td>
<td>B line data+ (RxD/TxD-P)</td>
</tr>
<tr>
<td>Pin 4</td>
<td>RTS</td>
</tr>
<tr>
<td>Pin 5</td>
<td>GND (0 V)</td>
</tr>
<tr>
<td>Pin 6</td>
<td>Potential (+5 VDC)</td>
</tr>
<tr>
<td>Pin 7</td>
<td>not assigned</td>
</tr>
<tr>
<td>Pin 8</td>
<td>A line data– (RxD/TxD-N)</td>
</tr>
<tr>
<td>Pin 9</td>
<td>not assigned</td>
</tr>
</tbody>
</table>

### Ethernet connection

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>RJ45 (10Base-T/100Base-TX)</td>
</tr>
</tbody>
</table>

### Certificates

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE</td>
<td></td>
</tr>
</tbody>
</table>
Technical data