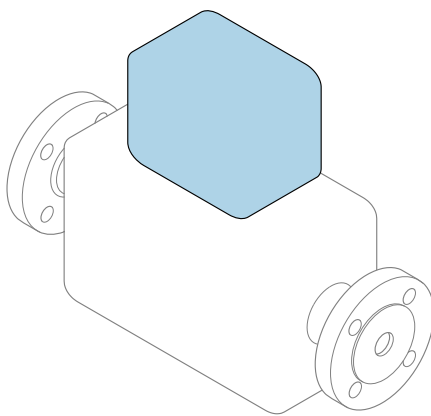


# Brief Operating Instructions

## Proline 100

### PROFIBUS DP


Transmitter with  
Coriolis sensor

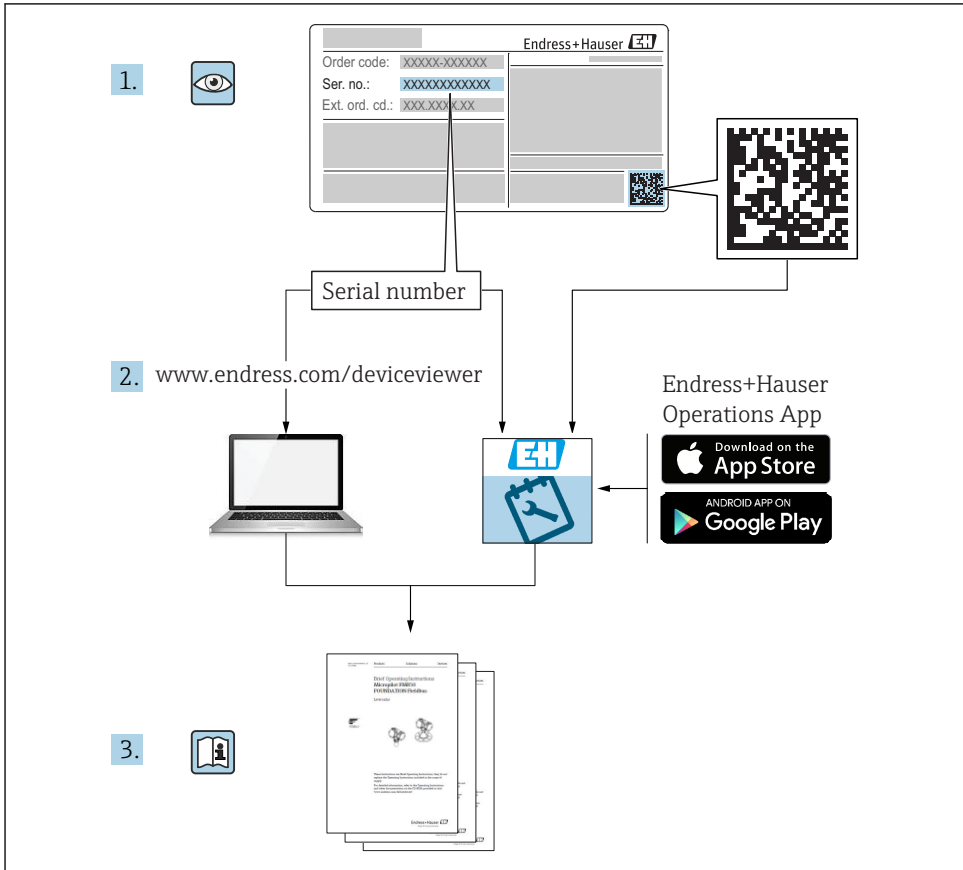


These instructions are Brief Operating Instructions; they are **not** a substitute for the Operating Instructions pertaining to the device.

#### **Transmitter Brief Operating Instructions**

Contain information about the transmitter.

Sensor Brief Operating Instructions →  3



A0023555

## Brief Operating Instructions for the device

The device consists of a transmitter and a sensor.

The process of commissioning these two components is described in two separate manuals:

- Sensor Brief Operating Instructions
- Transmitter Brief Operating Instructions

Please refer to both Brief Operating Instructions when commissioning the device as the contents of the manuals complement one another:

### Sensor Brief Operating Instructions

The Sensor Brief Operating Instructions are aimed at specialists with responsibility for installing the measuring device.

- Incoming acceptance and product identification
- Storage and transport
- Installation

### Transmitter Brief Operating Instructions

The Transmitter Brief Operating Instructions are aimed at specialists with responsibility for commissioning, configuring and parameterizing the measuring device (until the first measured value).

- Product description
- Installation
- Electrical connection
- Operation options
- System integration
- Commissioning
- Diagnostic information

## Additional device documentation



These Brief Operating Instructions are the **Transmitter Brief Operating Instructions**.

The "Sensor Brief Operating Instructions" are available via:

- Internet: [www.endress.com/deviceviewer](http://www.endress.com/deviceviewer)
- Smart phone/tablet: *Endress+Hauser Operations App*

Detailed information about the device can be found in the Operating Instructions and the other documentation:

- Internet: [www.endress.com/deviceviewer](http://www.endress.com/deviceviewer)
- Smart phone/tablet: *Endress+Hauser Operations App*





# Table of contents

|          |   |           |
|----------|---|-----------|
| <b>1</b> | <b>Document information</b>                         | <b>5</b>  |
| 1.1      | Symbols used  | 5         |
| <b>2</b> | <b>Basic safety instructions</b>                    | <b>7</b>  |
| 2.1      | Requirements for the personnel                      | 7         |
| 2.2      | Designated use                                      | 7         |
| 2.3      | Workplace safety                                    | 8         |
| 2.4      | Operational safety                                  | 8         |
| 2.5      | Product safety                                      | 8         |
| 2.6      | IT security   | 9         |
| <b>3</b> | <b>Product description</b>                          | <b>9</b>  |
| <b>4</b> | <b>Installation</b>                                 | <b>9</b>  |
| 4.1      | Mounting the measuring device                       | 9         |
| <b>5</b> | <b>Electrical connection</b>                        | <b>11</b> |
| 5.1      | Connection conditions                               | 11        |
| 5.2      | Connecting the measuring device                     | 15        |
| 5.3      | Special connection instructions                     | 17        |
| 5.4      | Hardware settings                                   | 17        |
| 5.5      | Ensuring the degree of protection                   | 19        |
| 5.6      | Post-connection check                               | 20        |
| <b>6</b> | <b>Operation options</b>                            | <b>21</b> |
| 6.1      | Overview of operating options                       | 21        |
| 6.2      | Structure and function of the operating menu        | 22        |
| 6.3      | Access to the operating menu via the web browser    | 22        |
| 6.4      | Access to the operating menu via the operating tool | 27        |
| <b>7</b> | <b>System integration</b>                           | <b>27</b> |
| 7.1      | Cyclic data transmission                            | 28        |
| <b>8</b> | <b>Commissioning</b>                                | <b>32</b> |
| 8.1      | Function check                                      | 32        |
| 8.2      | Setting the operating language                      | 32        |
| 8.3      | Configuring the measuring device                    | 32        |
| 8.4      | Protecting settings from unauthorized access        | 33        |
| <b>9</b> | <b>Diagnostic information</b>                       | <b>33</b> |











# 1 Document information

## 1.1 Symbols used





### 1.1.1 Safety symbols


| Symbol  | Meaning  |
|---|--|
|  | <b>DANGER!</b><br>This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury. |
|  | <b>WARNING!</b><br>This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury. |
|  | <b>CAUTION!</b><br>This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.  |
|  | <b>NOTE!</b><br>This symbol contains information on procedures and other facts which do not result in personal injury.                     |

### 1.1.2 Symbols for certain types of information






| Symbol  | Meaning  | Symbol  | Meaning  |
|---|--|---|--|
|    | <b>Permitted</b><br>Procedures, processes or actions that are permitted. |    | <b>Preferred</b><br>Procedures, processes or actions that are preferred. |
|    | <b>Forbidden</b><br>Procedures, processes or actions that are forbidden. |    | <b>Tip</b><br>Indicates additional information.                          |
|  | Reference to documentation   |  | Reference to page  |
|  | Reference to graphic   |  | Series of steps  |
|  | Result of a step   |  | Visual inspection  |

### 1.1.3 Electrical symbols





| Symbol  | Meaning                                | Symbol  | Meaning   |
|---|--|---|---|
|  | Direct current                         |  | Alternating current   |
|  | Direct current and alternating current |  | <b>Ground connection</b><br>A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system. |

| Symbol   | Meaning   |
|--|---|
|  | <p><b>Protective Earth (PE)</b></p> <p>A terminal which must be connected to ground prior to establishing any other connections.</p> <p>The ground terminals are situated inside and outside the device:</p> <ul style="list-style-type: none"><li>■ Inner ground terminal: Connects the protectiv earth to the mains supply.</li><li>■ Outer ground terminal: Connects the device to the plant grounding system.</li></ul> |

1.1.4 Tool symbols

| Symbol   | Meaning                | Symbol  | Meaning                |
|--|------------------------|---|------------------------|
|  | Torx screwdriver       |  | Flat blade screwdriver |
|  | Cross-head screwdriver |  | Allen key              |
|  | Open-ended wrench      |   |                        |

1.1.5 Symbols in graphics

| Symbol   | Meaning        | Symbol  | Meaning                        |
|--|----------------|---|--------------------------------|
| 1, 2, 3,...  | Item numbers   |  | Series of steps                |
| A, B, C, ...   | Views          | A-A, B-B, C-C, ...  | Sections                       |
|  | Hazardous area |  | Safe area (non-hazardous area) |
|  | Flow direction |   |                                |

## 2 Basic safety instructions

### 2.1 Requirements for the personnel

The personnel must fulfill the following requirements for its tasks:

- ▶ Trained, qualified specialists must have a relevant qualification for this specific function and task.
- ▶ Are authorized by the plant owner/operator.
- ▶ Are familiar with federal/national regulations.
- ▶ Before starting work, read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application).
- ▶ Follow instructions and comply with basic conditions.

### 2.2 Designated use

#### Application and media

- The measuring device described in these Brief Operating Instructions is intended only for flow measurement of liquids and gases.
- The measuring device described in these Brief Operating Instructions is intended only for flow measurement of liquids.

Depending on the version ordered, the measuring device can also measure potentially explosive, flammable, poisonous and oxidizing media.

Measuring devices for use in hazardous areas, in hygienic applications or where there is an increased risk due to process pressure, are labeled accordingly on the nameplate.

To ensure that the measuring device remains in proper condition for the operation time:

- ▶ Keep within the specified pressure and temperature range.
- ▶ Only use the measuring device in full compliance with the data on the nameplate and the general conditions listed in the Operating Instructions and supplementary documentation.
- ▶ Based on the nameplate, check whether the ordered device is permitted for the intended use in the hazardous area (e.g. explosion protection, pressure vessel safety).
- ▶ Use the measuring device only for media to which the process-wetted materials are sufficiently resistant.
- ▶ If the measuring device is not operated at atmospheric temperature, compliance with the relevant basic conditions specified in the associated device documentation is absolutely essential: "Documentation" section.
- ▶ Protect the measuring device permanently against corrosion from environmental influences.

#### Incorrect use

Non-designated use can compromise safety. The manufacturer is not liable for damage caused by improper or non-designated use.

#### WARNING

##### **Danger of breakage due to corrosive or abrasive fluids!**

- ▶ Verify the compatibility of the process fluid with the sensor material.
- ▶ Ensure the resistance of all fluid-wetted materials in the process.
- ▶ Keep within the specified pressure and temperature range.

**NOTICE****Verification for borderline cases:**

- ▶ For special fluids and fluids for cleaning, Endress+Hauser is glad to provide assistance in verifying the corrosion resistance of fluid-wetted materials, but does not accept any warranty or liability as minute changes in the temperature, concentration or level of contamination in the process can alter the corrosion resistance properties.

**Residual risks****⚠ WARNING**

**The electronics and the medium may cause the surfaces to heat up. This presents a burn hazard!**

- ▶ For elevated fluid temperatures, ensure protection against contact to prevent burns.

*Only applies for Proline Promass E, F, O, X and Cubemass C*

**⚠ WARNING****Danger of housing breaking due to measuring tube breakage!**

- ▶ In the event of a measuring tube breakage for a device version without rupture disk it is possible for the pressure loading capacity of the sensor housing to be exceeded. This can lead to rupture or failure of the sensor housing.

## 2.3 Workplace safety

For work on and with the device:

- ▶ Wear the required personal protective equipment according to federal/national regulations.

For welding work on the piping:

- ▶ Do not ground the welding unit via the measuring device.

If working on and with the device with wet hands:

- ▶ Due to the increased risk of electric shock, gloves must be worn.

## 2.4 Operational safety

Risk of injury.

- ▶ Operate the device in proper technical condition and fail-safe condition only.
- ▶ The operator is responsible for interference-free operation of the device.

## 2.5 Product safety

This measuring device is designed in accordance with good engineering practice to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate.

It meets general safety standards and legal requirements. It also complies with the EU directives listed in the device-specific EU Declaration of Conformity. Endress+Hauser confirms this by affixing the CE mark to the device.



## 2.6 IT security

We only provide a warranty if the device is installed and used as described in the Operating Instructions. The device is equipped with security mechanisms to protect it against any inadvertent changes to the device settings.

IT security measures in line with operators' security standards and designed to provide additional protection for the device and device data transfer must be implemented by the operators themselves.

## 3 Product description

The device consists of a transmitter and a sensor.

The device is available as a compact version:


The transmitter and sensor form a mechanical unit.



For detailed information on the product description, see the Operating Instructions for the device

## 4 Installation



For detailed information about mounting the sensor, see the Sensor Brief Operating Instructions →  3

### 4.1 Mounting the measuring device

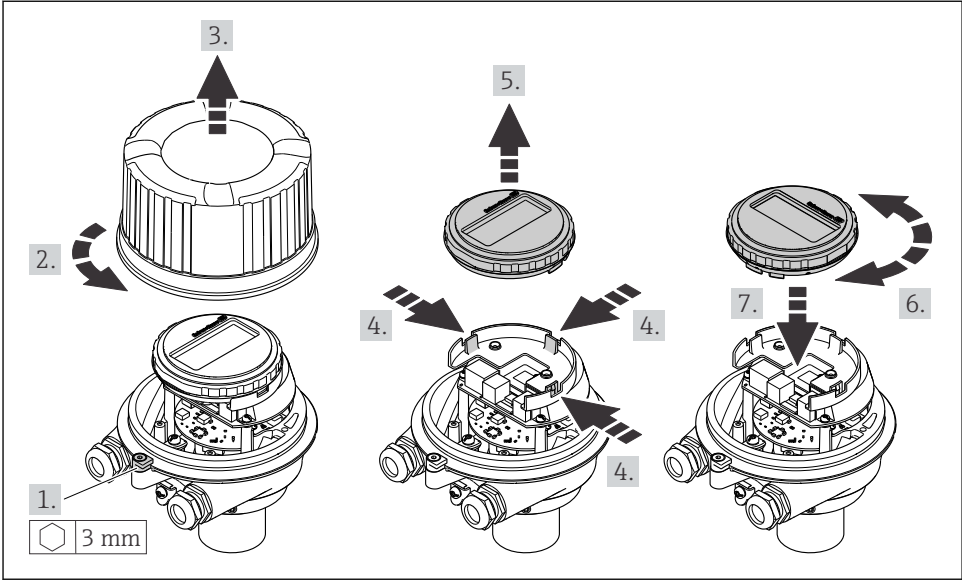
#### 4.1.1 Turning the display module

The local display is only available with the following device version:

Order code for "Display; operation", option **B**: 4-line; illuminated, via communication

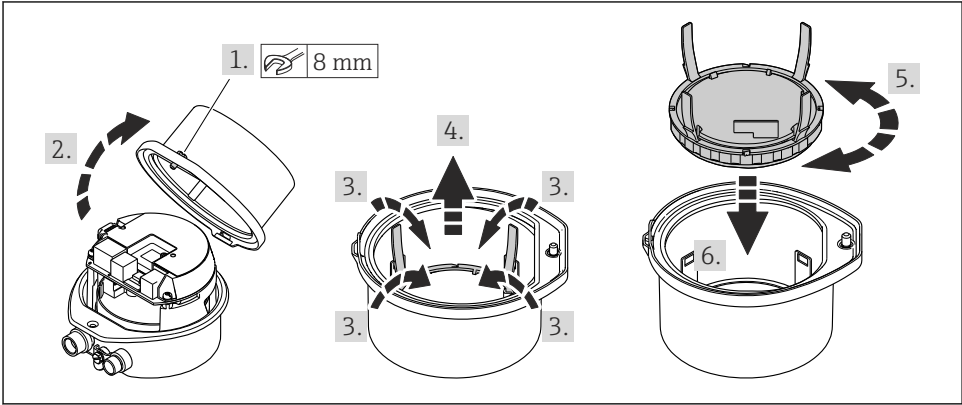
The display module can be turned to optimize display readability.

Aluminum housing version



A0023192

Compact and ultra-compact housing versions



A0023195

## 5 Electrical connection

### NOTICE

**The measuring device does not have an internal circuit breaker.**

- ▶ For this reason, assign the measuring device a switch or power-circuit breaker so that the power supply line can be easily disconnected from the mains.
- ▶ Although the measuring device is equipped with a fuse, additional overcurrent protection (maximum 16 A) should be integrated into the system installation.

### 5.1 Connection conditions

#### 5.1.1 Required tools

- For cable entries: Use corresponding tools
- For securing clamp (on aluminum housing): Allen screw 3 mm
- For securing screw (for stainless steel housing): open-ended wrench 8 mm
- Wire stripper
- When using stranded cables: crimper for wire end ferrule

#### 5.1.2 Requirements for connecting cable

The connecting cables provided by the customer must fulfill the following requirements.

#### Electrical safety

In accordance with applicable federal/national regulations.

#### Permitted temperature range

- The installation guidelines that apply in the country of installation must be observed.
- The cables must be suitable for the minimum and maximum temperatures to be expected.

#### Power supply cable

Standard installation cable is sufficient.

#### Signal cable

##### *PROFIBUS DP*

The IEC 61158 standard specifies two types of cable (A and B) for the bus line which can be used for every transmission rate. Cable type A is recommended.



For detailed information about the specification of the connecting cable, see the Operating Instructions for the device.

#### Cable diameter

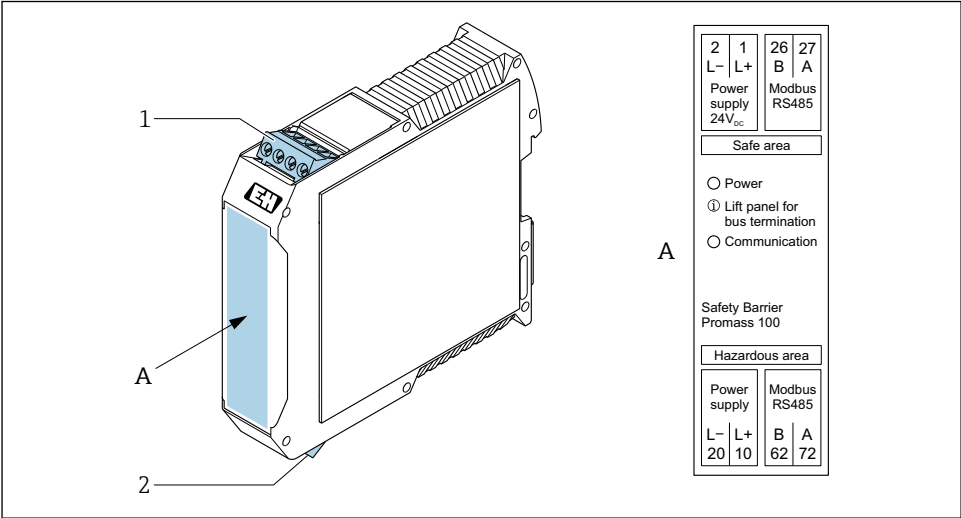
- Cable glands supplied:  
M20 × 1.5 with cable Ø 6 to 12 mm (0.24 to 0.47 in)
- Spring terminals:  
Wire cross-sections 0.5 to 2.5 mm<sup>2</sup> (20 to 14 AWG)

5.1.3 Terminal assignment

The terminal assignment for the electrical connection of the device can be found on the connection nameplate of the electronics module.

In addition, the device version with Modbus RS485 is supplied with the Safety Barrier Promass 100 whose nameplate also bears information on the terminals.

Safety Barrier Promass 100



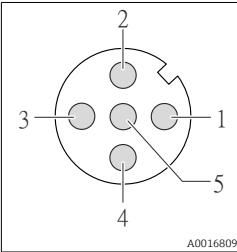
1 Safety Barrier Promass 100 with terminals

- 1 Non-hazardous area and Zone 2/Div. 2
- 2 Intrinsically safe area

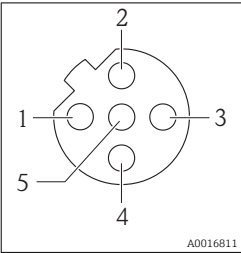
5.1.4 Pin assignment, device plug

Supply voltage

**i** For use in the non-hazardous area and Zone 2/Div. 2.

|  | Pin    | Assignment  |                     |
|--|--------|-------------|---------------------|
|  |        |             |                     |
|  | 1      | L+          | DC 24 V             |
|  | 2      |             | Not assigned        |
|  | 3      |             | Not assigned        |
|  | 4      | L-          | DC 24 V             |
|  | 5      |             | Grounding/shielding |
|  | Coding | Plug/socket |                     |
|  | A      | Plug        |                     |

Device plug for signal transmission (device side)

|  | Pin    | Assignment  |                     |
|---|--------|-------------|---------------------|
|   | 1      |             | Not assigned        |
|   | 2      | A           | PROFIBUS DP         |
|   | 3      |             | Not assigned        |
|   | 4      | B           | PROFIBUS DP         |
|   | 5      |             | Grounding/shielding |
|   | Coding | Plug/socket |                     |
|   | B      | Socket      |                     |

5.1.5 Shielding and grounding

PROFIBUS DP

Optimum electromagnetic compatibility (EMC) of the fieldbus system can only be guaranteed if the system components and, in particular, the lines are shielded and the shield forms as complete a cover as possible. A shield coverage of 90% is ideal.

- To ensure an optimum EMC protective effect, connect the shield as often as possible to the reference ground.
- For reasons of explosion protection, you should refrain from grounding however.

To comply with both requirements, the fieldbus system allows three different types of shielding:

- Shielding at both ends.
- Shielding at one end on the feed side with capacitance termination at the field device.
- Shielding at one end on the feed side.

Experience shows that the best results with regard to EMC are achieved in most cases in installations with one-sided shielding on the feed side (without capacitance termination at the field device). Appropriate measures with regard to input wiring must be taken to allow unrestricted operation when EMC interference is present. These measures have been taken into account for this device. Operation in the event of disturbance variables as per NAMUR NE21 is thus guaranteed.

Where applicable, national installation regulations and guidelines must be observed during the installation!

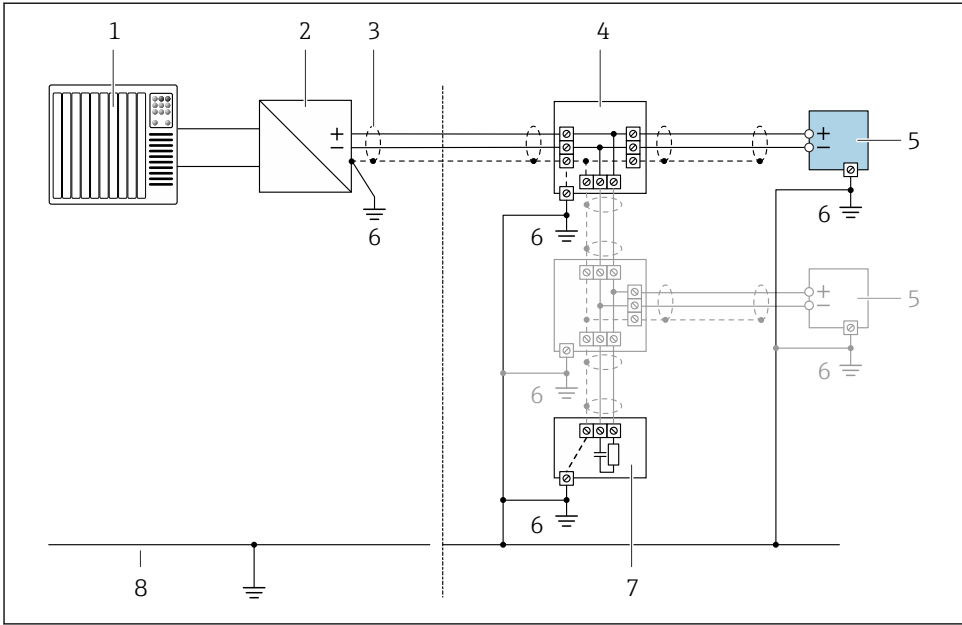
Where there are large differences in potential between the individual grounding points, only one point of the shielding is connected directly with the reference ground. In systems without potential equalization, therefore, cable shielding of fieldbus systems should only be grounded on one side, for example at the fieldbus supply unit or at safety barriers.

NOTICE

**In systems without potential matching, the multiple grounding of the cable shield causes mains frequency equalizing currents!**

Damage to the bus cable shield.

- ▶ Only ground the bus cable shield to either the local ground or the protective ground at one end. Insulate the shield that is not connected.



A0028768

- 1 Controller (e.g. PLC)
- 2 Segment coupler PROFIBUS DP/PA
- 3 Cable shield
- 4 T-box
- 5 Measuring device
- 6 Local grounding
- 7 Bus terminator
- 8 Potential matching line

### 5.1.6 Preparing the measuring device

#### NOTICE

#### Insufficient sealing of the housing!

Operational reliability of the measuring device could be compromised.

- Use suitable cable glands corresponding to the degree of protection.

1. Remove dummy plug if present.
2. If the measuring device is supplied without cable glands:  
Provide suitable cable gland for corresponding connecting cable.
3. If the measuring device is supplied with cable glands:  
Observe requirements for connecting cables → 11.

## 5.2 Connecting the measuring device

### NOTICE

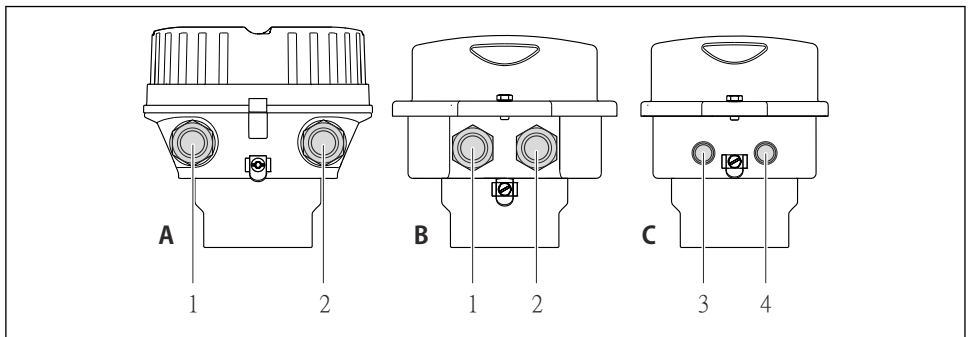
#### Limitation of electrical safety due to incorrect connection!

- ▶ Have electrical connection work carried out by appropriately trained specialists only.
- ▶ Observe applicable federal/national installation codes and regulations.
- ▶ Comply with local workplace safety regulations.
- ▶ Always connect the protective ground cable  $\ominus$  before connecting additional cables.
- ▶ For use in potentially explosive atmospheres, observe the information in the device-specific Ex documentation.
- ▶ The power unit must be tested to ensure it meets safety requirements (e.g. PELV, SELV).

### 5.2.1 Connecting the transmitter

The connection of the transmitter depends on the following order codes:

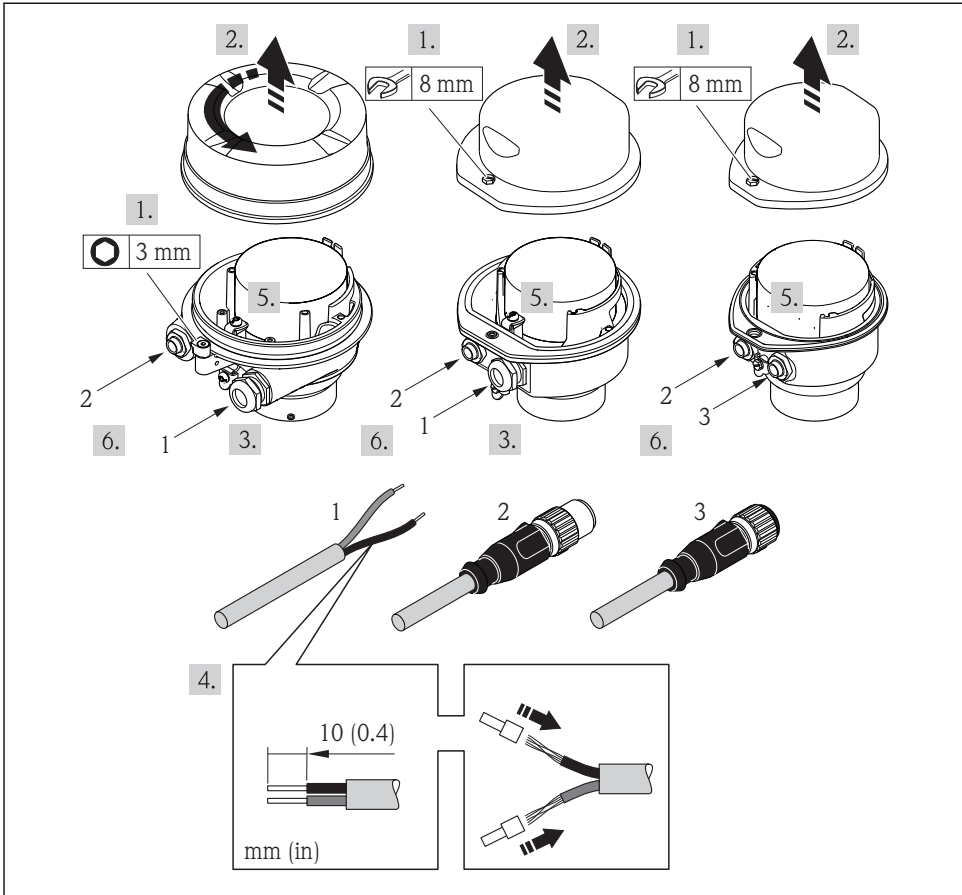
- Housing version: compact or ultra-compact
- Connection version: device plug or terminals



A0016924

#### 2 Housing versions and connection versions

- A Compact, coated aluminum
- B Compact hygienic, stainless or compact, stainless
- 1 Cable entry or device plug for signal transmission
- 2 Cable entry or device plug for supply voltage
- C Ultra-compact hygienic, stainless or ultra-compact, stainless
- 3 Device plug for signal transmission
- 4 Device plug for supply voltage



A0017844

### 3 Device versions with connection examples

- 1 Cable
- 2 Device plug for signal transmission
- 3 Device plug for supply voltage

**i** Depending on the housing version disconnect the local display from the main electronics module: Operating Instructions for the device .

- Connect the cable in accordance with the terminal assignment or the device plug pin assignment .



## 5.2.2 Ensuring potential equalization

### Promass, Cubemass

#### Requirements

No special measures for potential equalization are required.

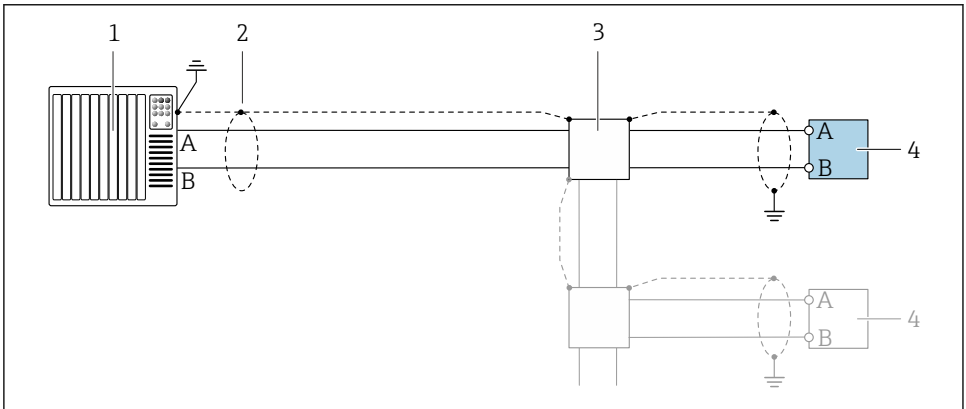


For devices intended for use in hazardous locations, please observe the guidelines in the Ex documentation (XA).

## 5.3 Special connection instructions

### 5.3.1 Connection examples

#### PROFIBUS DP



A0028765



4 Connection example for PROFIBUS DP, non-hazardous area and Zone 2/Div. 2

- 1 Control system (e.g. PLC)
- 2 Cable shield: the cable shield must be grounded at both ends to comply with EMC requirements; observe cable specifications
- 3 Transmitter



If baud rates > 1.5 MBaud an EMC cable entry must be used and the cable shield must continue as far as the terminal wherever possible.

## 5.4 Hardware settings

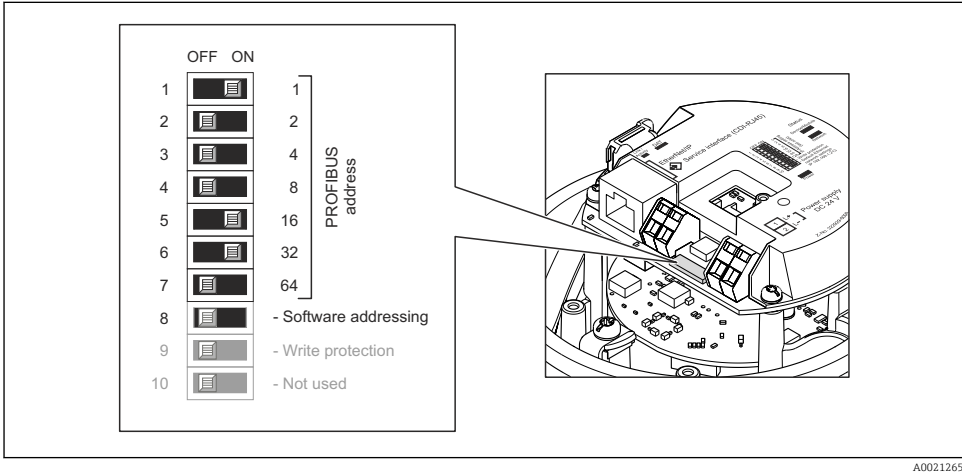
### 5.4.1 Setting the device address

#### PROFIBUS DP

The address must always be configured for a PROFIBUS DP/PA device. The valid address range is between 1 and 126. In a PROFIBUS DP/PA network, each address can only be

assigned once. If an address is not configured correctly, the device is not recognized by the master. All measuring devices are delivered from the factory with the device address 126 and with the software addressing method.

### Setting the address



A0021265

#### 5 Addressing using DIP switches on the I/O electronics module

1. Disable software addressing via DIP switch 8 (OFF).
2. Set the desired device address via the corresponding DIP switches.

↳ Example → 5, 18:  $1 + 16 + 32 = \text{device address } 49$

The device demands rebooting after 10 s. After rebooting, hardware addressing is enabled with the configured IP address.

### 5.4.2 Enabling the terminating resistor

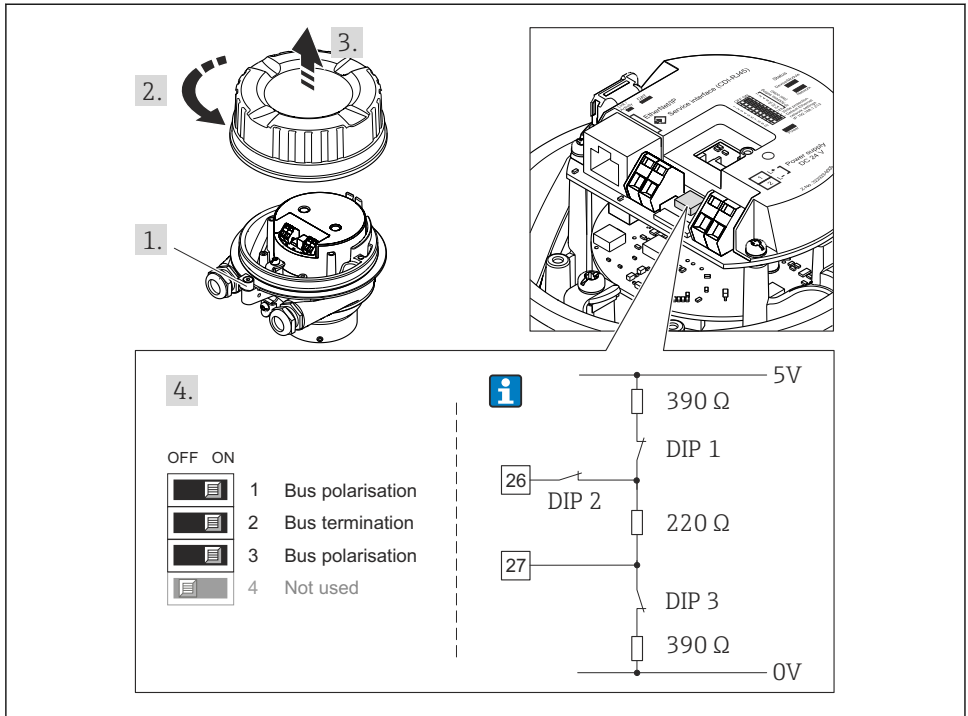
#### PROFIBUS DP

To avoid incorrect communication transmission caused by impedance mismatch, terminate the PROFIBUS DP cable correctly at the start and end of the bus segment.

- If the device is operated with a baud rate of 1.5 MBaud and under:  
For the last transmitter on the bus, terminate via DIP switch 2 (bus termination) and DIP switch 1 and 3 (bus polarization). Setting: ON – ON – ON → 5, 6, 19.
- For baud rates > 1.5 MBaud:  
Due to the capacitance load of the user and the line reflections generated as a result, ensure that an external bus terminator is used.



It is generally advisable to use an external bus terminator as the entire segment can fail if a device that is terminated internally is defective.



A0021274

6 Termination using DIP switches on the I/O electronics module (for baud rates < 1.5 Mbaud)

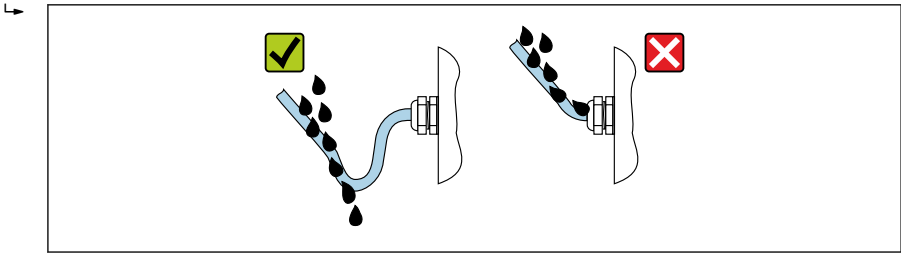
## 5.5 Ensuring the degree of protection

The measuring device fulfills all the requirements for the IP66/67 degree of protection, Type 4X enclosure.

To guarantee IP66/67 degree of protection, Type 4X enclosure, carry out the following steps after the electrical connection:

1. Check that the housing seals are clean and fitted correctly.
2. Dry, clean or replace the seals if necessary.
3. Tighten all housing screws and screw covers.
4. Firmly tighten the cable glands.

5. To ensure that moisture does not enter the cable entry:  
Route the cable so that it loops down before the cable entry ("water trap").



A0029278

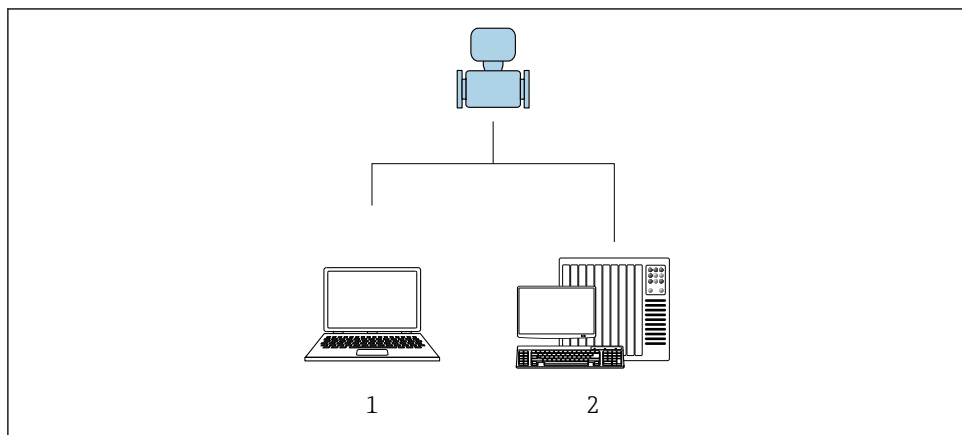
6. Insert dummy plugs into unused cable entries.

### 5.6 Post-connection check

|   |                          |
|---|--------------------------|
| Are cables or the device undamaged (visual inspection)?   | <input type="checkbox"/> |
| Do the cables used meet the requirements → 11?  | <input type="checkbox"/> |
| Do the cables have adequate strain relief?  | <input type="checkbox"/> |
| Are all the cable glands installed, firmly tightened and leak-tight? Cable run with "water trap" → 19 ? | <input type="checkbox"/> |
| Depending on the device version: are all the device plugs firmly tightened ?                            | <input type="checkbox"/> |
| Does the supply voltage match the specifications on the transmitter nameplate ?                         | <input type="checkbox"/> |
| Is the terminal assignment or pin assignment of the connector → 12 correct?                             | <input type="checkbox"/> |
| If supply voltage is present, is the power LED on the electronics module of the transmitter lit green ? | <input type="checkbox"/> |
| Depending on the device version, is the securing clamp or fixing screw firmly tightened?                | <input type="checkbox"/> |

## 6 Operation options

### 6.1 Overview of operating options

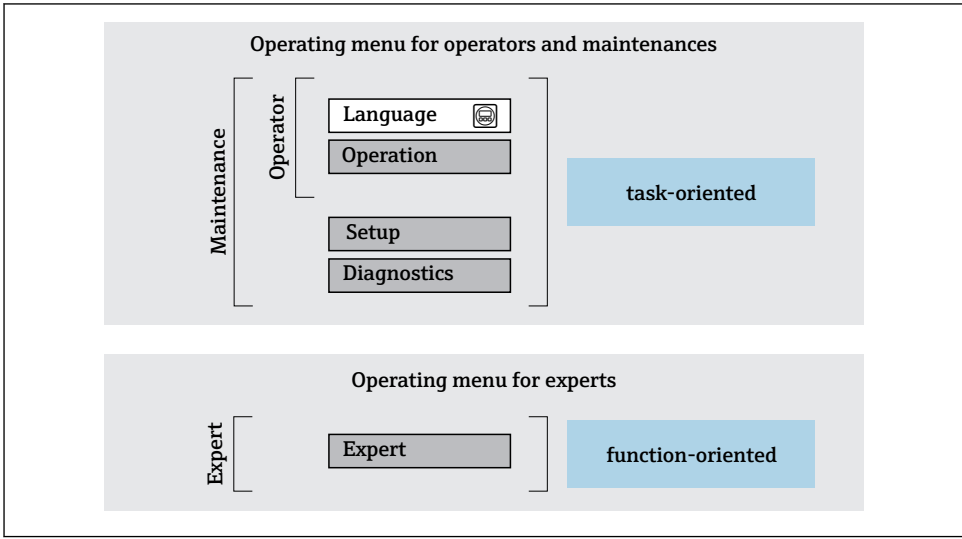


A0017760

- 1 Computer with Web browser (e.g. Internet Explorer) or with "FieldCare" operating tool
- 2 Automation system, e.g. "RSLogix" (Rockwell Automation) and work station for measuring device operation with Add-on Profile Level 3 for "RSLogix 5000" software (Rockwell Automation)

## 6.2 Structure and function of the operating menu

### 6.2.1 Structure of the operating menu



7 Schematic structure of the operating menu

### 6.2.2 Operating philosophy

The individual parts of the operating menu are assigned to certain user roles (operator, maintenance etc.). Each user role contains typical tasks within the device lifecycle.

For detailed information on the operating philosophy, see the Operating Instructions for the device.

## 6.3 Access to the operating menu via the web browser

### 6.3.1 Function range

Thanks to the integrated Web server, the device can be operated and configured via a Web browser and via a service interface (CDI-RJ45) . In addition to the measured values, status information on the device is also displayed and allows the user to monitor the status of the device. Furthermore the device data can be managed and the network parameters can be configured.


For additional information on the Web server, refer to the Special Documentation for the device

### 6.3.2 Prerequisites


#### Computer hardware

|            |  |
|------------|--|
| Interface  | The computer must have an RJ45 interface.                  |
| Connection | Standard Ethernet cable with RJ45 connector.               |
| Screen     | Recommended size: ≥ 12" (depends on the screen resolution) |

#### Computer software

|                               |   |
|-------------------------------|---|
| Recommended operating systems | <p>Microsoft Windows 7 or higher.</p> <p> Microsoft Windows XP is supported.</p>                           |
| Web browsers supported        | <ul style="list-style-type: none"> <li>■ Microsoft Internet Explorer 8 or higher</li> <li>■ Microsoft Edge</li> <li>■ Mozilla Firefox</li> <li>■ Google Chrome</li> <li>■ Safari</li> </ul> |

#### Computer settings

|  |   |
|--|---|
| User rights                              | Appropriate user rights (e.g. administrator rights) for TCP/IP and proxy server settings are necessary (for adjusting the IP address, subnet mask etc.).  |
| Proxy server settings of the Web browser | The Web browser setting <i>Use a Proxy Server for Your LAN</i> must be <b>deselected</b> .  |
| JavaScript                               | <p>JavaScript must be enabled.</p> <p> If JavaScript cannot be enabled:<br/>enter <code>http://XXX.XXX.X.XXX/basic.html</code> in the address line of the Web browser, e.g. <code>http://192.168.1.212/basic.html</code>. A fully functional but simplified version of the operating menu structure starts in the Web browser.</p> |
| Network connections                      | <p>Only the active network connections to the measuring device should be used.</p> <p>Switch off all other network connections such as WLAN.</p>  |



In the event of connection problems:

#### Measuring device: Via CDI-RJ45 service interface

| Device           | CDI-RJ45 service interface                      |
|------------------|---|
| Measuring device | The measuring device has an RJ45 interface.     |
| Web server       | Web server must be enabled; factory setting: ON |

### 6.3.3 Establishing a connection

#### Via service interface (CDI-RJ45)

*Preparing the measuring device*

*Configuring the Internet protocol of the computer*

The following information refers to the default Ethernet settings of the device.

IP address of the device: 192.168.1.212 (factory setting)

1. Switch on the measuring device.
2. Connect to the computer using a cable .
3. If a 2nd network card is not used, close all the applications on the notebook.
  - ↳ Applications requiring Internet or a network, such as e-mail, SAP applications, Internet or Windows Explorer.
4. Close any open Internet browsers.
5. Configure the properties of the Internet protocol (TCP/IP) as defined in the table:

|                 |  |
|-----------------|--|
| IP address      | 192.168.1.XXX; for XXX all numerical sequences except: 0, 212 and 255 → e.g. 192.168.1.213 |
| Subnet mask     | 255.255.255.0  |
| Default gateway | 192.168.1.212 or leave cells empty   |

#### Starting the Web browser

1. Start the Web browser on the computer.
2. Enter the IP address of the Web server in the address line of the Web browser: 192.168.1.212
  - ↳ The login page appears.



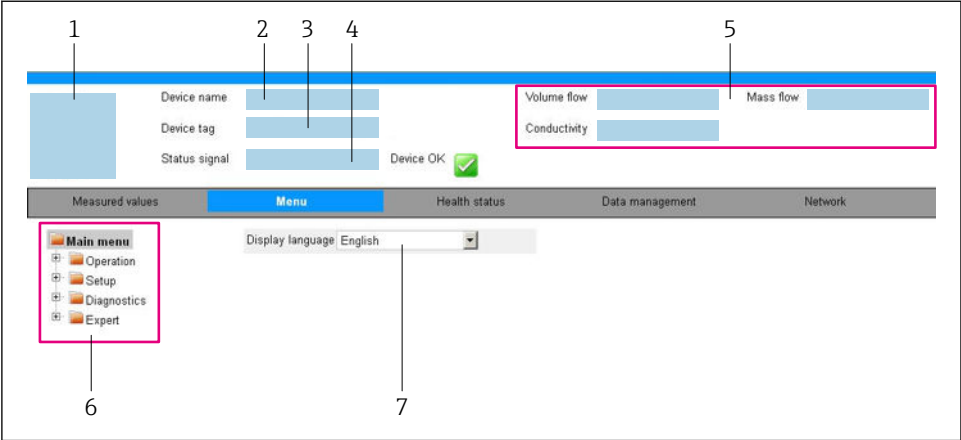
If a login page does not appear, or if the page is incomplete, see the Special Documentation for the Web server

### 6.3.4 Logging on

|             |  |
|-------------|--|
| Access code | 0000 (factory setting); can be changed by customer |
|-------------|--|



6.3.5 User interface



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- 1 Picture of device
- 2 Device name
- 3 Device tag
- 4 Status signal
- 5 Current measured values
- 6 Navigation area
- 7 Local display language

Header

The following information appears in the header:

- Device tag
- Device status with status signal
- Current measured values

Function row

| Functions       | Meaning  |
|-----------------|--|
| Measured values | Displays the measured values of the measuring device   |
| Menu            | <ul style="list-style-type: none"><li>■ Access to the operating menu from the measuring device</li><li>■ The structure of the operating menu is the same as for the operating tools</li></ul>  For detailed information on the structure of the operating menu, see the Operating Instructions for the measuring device |
| Device status   | Displays the diagnostic messages currently pending, listed in order of priority  |

| Functions             | Meaning  |
|-----------------------|--|
| Data management       | <p>Data exchange between PC and measuring device:</p> <ul style="list-style-type: none"><li>■ Device configuration:<ul style="list-style-type: none"><li>– Load settings from the device (XML format, save configuration)</li><li>– Save settings to the device (XML format, restore configuration)</li></ul></li><li>■ Logbook - Export Event logbook (.csv file)</li><li>■ Documents - Export documents:<ul style="list-style-type: none"><li>– Export backup data record (.csv file, create documentation of the measuring point configuration)</li><li>– Verification report (PDF file, only available with the "Heartbeat Verification" application package)</li></ul></li><li>■ File for system integration - If using fieldbuses, upload device drivers for system integration from the measuring device: PROFIBUS DP: GSD file</li></ul> |
| Network configuration | <p>Configuration and checking of all the parameters required for establishing the connection to the measuring device:</p> <ul style="list-style-type: none"><li>■ Network settings (e.g. IP address, MAC address)</li><li>■ Device information (e.g. serial number, firmware version)</li></ul>  |
| Logout                | End the operation and call up the login page   |

Navigation area

If a function is selected in the function bar, the submenus of the function open in the navigation area. The user can now navigate through the menu structure.

Working area

Depending on the selected function and the related submenus, various actions can be performed in this area:

- Configuring parameters
- Reading measured values
- Calling up help text
- Starting an upload/download

6.3.6 Disabling the Web server

The Web server of the measuring device can be switched on and off as required using the **Web server functionality** parameter.

Navigation

"Expert" menu → Communication → Web server

Parameter overview with brief description

| Parameter                | Description                       | Selection   | Factory setting |
|--------------------------|-----------------------------------|---|-----------------|
| Web server functionality | Switch the Web server on and off. | <ul style="list-style-type: none"><li>■ Off</li><li>■ HTML Off</li><li>■ On</li></ul> | On              |

## Function scope of the "Web server functionality" parameter

| Option | Description  |
|--------|--|
| Off    | <ul style="list-style-type: none"> <li>■ The web server is completely disabled.</li> <li>■ Port 80 is locked.</li> </ul>   |
| On     | <ul style="list-style-type: none"> <li>■ The complete functionality of the web server is available.</li> <li>■ JavaScript is used.</li> <li>■ The password is transferred in an encrypted state.</li> <li>■ Any change to the password is also transferred in an encrypted state.</li> </ul> |

### Enabling the Web server

If the Web server is disabled it can only be re-enabled with the **Web server functionality** parameter via the following operating options:

- Via Bedientool "FieldCare"
- Via "DeviceCare" operating tool

#### 6.3.7 Logging out



Before logging out, perform a data backup via the **Data management** function (upload configuration from device) if necessary.

1. Select the **Logout** entry in the function row.  
 ↳ The home page with the Login box appears.
2. Close the Web browser.
3. If no longer needed:  
 Reset modified properties of the Internet protocol (TCP/IP) → 📄 24.

## 6.4 Access to the operating menu via the operating tool



The operating menu can also be accessed via the FieldCare and DeviceCare operating tools. See the Operating Instructions for the device.

## 7 System integration



For detailed information on system integration, see the Operating Instructions for the device.






- Overview of device description files
  - Current version data for the device
  - Operating tools
- Device master file (GSD)
  - Manufacturer-specific GSD
  - Profile GSD
- Cyclic data transmission
  - Block model
  - Description of the modules

## 7.1 Cyclic data transmission

Cyclic data transmission when using the device master file (GSD).

### 7.1.1 Block model

The block model shows which input and output data the measuring device makes available for cyclic data exchange. Cyclic data exchange takes place with a PROFIBUS master (Class 1), e.g. a control system.

| Measuring device |                              |  |                      | Control system |
|------------------|------------------------------|--|----------------------|----------------|
| Transducer Block | Analog Input block 1 to 8    | →  29 | Output value AI      | →              |
|                  | Totalizer block 1 to 3       | →  29 | Output value TOTAL   | →              |
|                  |                              |  | Controller SETTOT    | ←              |
|                  |                              |  | Configuration MODTOT | ←              |
|                  | Analog Output block 1 to 3   | →  31 | Input values AO      | ←              |
|                  | Discrete Input block 1 to 2  | →  31 | Output values DI     | →              |
|                  | Discrete Output block 1 to 3 | →  32 | Input values DO      | ←              |
|                  |                              |  |                      | PROFIBUS DP    |

### Defined order of modules

The modules are permanently assigned to the slots, i.e. when configuring the modules, the order and the arrangement of the modules must be respected.

| Slot   | Module  | Function block               |
|--------|---|------------------------------|
| 1 to 8 | AI  | Analog Input block 1 to 8    |
| 9      | TOTAL or<br>SETTOT_TOTAL or<br>SETTOT_MODETOT_TOTAL | Totalizer block 1            |
| 10     |   | Totalizer block 2            |
| 11     |   | Totalizer block 3            |
| 12-14  | AO  | Analog Output block 1 to 3   |
| 15-16  | DI  | Discrete Input block 1 to 2  |
| 17-19  | DO  | Discrete Output block 1 to 3 |

To optimize the data throughput rate of the PROFIBUS network, it is advisable to only configure modules that are processed in the PROFIBUS master system. If this results in gaps between the configured modules, these gaps must be assigned to the EMPTY MODULE.

### 7.1.2 Description of the modules

The data structure is described from the perspective of the PROFIBUS master:

- Input data: Are sent from the measuring device to the PROFIBUS master.
- Output data: Are sent from the PROFIBUS master to the measuring device.

## AI module (Analog Input)

Transmit an input variable from the measuring device to the PROFIBUS master (Class 1).  
Eight Analog Input blocks are available (slot 1 to 8).

*Selection: input variable*

The input variable can be specified using the CHANNEL parameter.

*Factory setting*

| Function block | Factory setting       |
|----------------|-----------------------|
| AI 1           | Mass flow             |
| AI 2           | Volume flow           |
| AI 3           | Corrected volume flow |
| AI 4           | Density               |
| AI 5           | Reference density     |
| AI 6           | Temperature           |
| AI 7           | Off                   |
| AI 8           | Off                   |

## TOTAL module

Transmit a totalizer value from the measuring device to the PROFIBUS master (Class 1).  
Three Totalizer blocks are available (slot 9 to 11).

*Selection: totalizer value*

The totalizer value can be specified using the CHANNEL parameter.

| CHANNEL | Input variable                       |
|---------|--------------------------------------|
| 32961   | Mass flow                            |
| 33122   | Volume flow                          |
| 33093   | Corrected volume flow                |
| 901     | Target fluid mass flow <sup>1)</sup> |
| 793     | Carrier mass flow <sup>1)</sup>      |

1) Only available with the "Concentration" application package

*Factory setting*

| Function block       | Factory setting: TOTAL |
|----------------------|------------------------|
| Totalizer 1, 2 and 3 | Mass flow              |

## SETTOT\_TOTAL module

The module combination consists of the SETTOT and TOTAL functions:

- SETTOT: Control the totalizers via the PROFIBUS master.
- TOTAL: Transmit totalizer value, along with the status, to the PROFIBUS master.

Three Totalizer blocks are available (slot 9 to 11).

*Selection: control totalizer*

| CHANNEL | Value SETTOT | Control totalizer               |
|---------|--------------|---------------------------------|
| 33310   | 0            | Totalize                        |
| 33046   | 1            | Resetting                       |
| 33308   | 2            | Adopt totalizer initial setting |

*Factory setting*

| Function block       | Factory setting: Value SETTOT (meaning) |
|----------------------|---|
| Totalizer 1, 2 and 3 | 0 (totalizing)                          |

## SETTOT\_MODETOT\_TOTAL module

The module combination consists of the SETTOT, MODETOT and TOTAL functions:

- SETTOT: Control the totalizers via the PROFIBUS master.
- MODETOT: Configure the totalizers via the PROFIBUS master.
- TOTAL: Transmit totalizer value, along with the status, to the PROFIBUS master.

Three Totalizer blocks are available (slot 9 to 11).

*Selection: totalizer configuration*

| CHANNEL | MODETOT value | Totalizer configuration   |
|---------|---------------|---------------------------|
| 33306   | 0             | Balancing                 |
| 33028   | 1             | Balance the positive flow |
| 32976   | 2             | Balance the negative flow |
| 32928   | 3             | Stop totalizing           |

*Factory setting*

| Function block       | Factory setting: Value MODETOT (meaning) |
|----------------------|--|
| Totalizer 1, 2 and 3 | 0 (balancing)                            |

## AO module (Analog Output)

Transmit a compensation value from the PROFIBUS master (Class 1) to the measuring device. Three Analog Output blocks are available (slot 12 to 14).

### Assigned compensation values

A compensation value is permanently assigned to the individual Analog Output blocks.

| CHANNEL | Function block | Compensation value                 |
|---------|----------------|------------------------------------|
| 306     | AO 1           | External pressure <sup>1)</sup>    |
| 307     | AO 2           | External temperature <sup>1)</sup> |
| 488     | AO 3           | External reference density         |

1) The compensation values must be transmitted to the device in the SI basic unit



The selection is made via: Expert → Sensor → External compensation

## DI module (Discrete Input)

Transmit discrete input values from the measuring device to the PROFIBUS master (Class 1). Discrete input values are used by the measuring device to transmit the state of device functions to the PROFIBUS master (Class 1).

Two Discrete Input blocks are available (slot 15 to 16).

### Selection: device function

The device function can be specified using the CHANNEL parameter.

| CHANNEL | Device function                   | Factory setting: Status (meaning)  |
|---------|-----------------------------------|--|
| 893     | Status switch output              | <ul style="list-style-type: none"> <li>■ 0 (device function not active)</li> <li>■ 1 (device function active)</li> </ul> |
| 894     | Empty pipe detection              |  |
| 895     | Low flow cut off                  |  |
| 1430    | Verification status <sup>1)</sup> |  |

1) Only available with the Heartbeat Verification application package

### Factory setting

| Function block | Factory setting      |
|----------------|----------------------|
| DI 1           | Empty pipe detection |
| DI 2           | Low flow cut off     |

**DO module (Discrete Output)**

Transmit discrete output values from the PROFIBUS master (Class 1) to the measuring device. Discrete output values are used by the PROFIBUS master (Class 1) to enable and disable device functions.

Three Discrete Output blocks are available (slot 17 to 19).

*Assigned device functions*

A device function is permanently assigned to the individual Discrete Output blocks.

| CHANNEL | Function block | Device function                  | Values: control (meaning)  |
|---------|----------------|----------------------------------|--|
| 891     | DO 1           | Flow override                    | <ul style="list-style-type: none"><li>0 (disable device function)</li><li>1 (enable device function)</li></ul> |
| 890     | DO 2           | Zero point adjustment            |  |
| 1429    | DO 3           | Start verification <sup>1)</sup> |  |

1) Only available with the Heartbeat Verification application package


**EMPTY\_MODULE module**

This module is used to assign empty spaces arising from modules not being used in the slots .

8 Commissioning

8.1 Function check

Before commissioning the measuring device:

- Make sure that the post-installation and post-connection checks have been performed.
- "Post-installation check" checklist
- "Post-connection check" checklist →  20

8.2 Setting the operating language

Factory setting: English or ordered local language

The operating language can be set in FieldCare, DeviceCare or via the Web server: Operation → Display language

8.3 Configuring the measuring device

The **Setup** menu with its submenus enable fast commissioning of the measuring device. The submenus contain all the parameters required for configuration, such as parameters for measurement or communication.

 The submenus available in the particular device can vary on account of the device version (e.g. sensor).



| Submenu                         | Meaning                                       |
|---------------------------------|---|
| Medium selection                | Define the medium                             |
| Output conditioning             | Define the output conditioning                |
| System units                    | Configure the units for all measured values   |
| Communication                   | Configure the digital communication interface |
| Display                         | Configure the measured value display          |
| Analog inputs                   | Configure the analog inputs                   |
| Low flow cut off                | Set the low flow cut off                      |
| Partially filled pipe detection | Configure partial and empty pipe detection    |

## 8.4 Protecting settings from unauthorized access

The following write protection options exist in order to protect the configuration of the measuring device from unintentional modification:

- Protect access to parameters via access code
- Protect access to local operation via key locking
- Protect access to measuring device via write protection switch



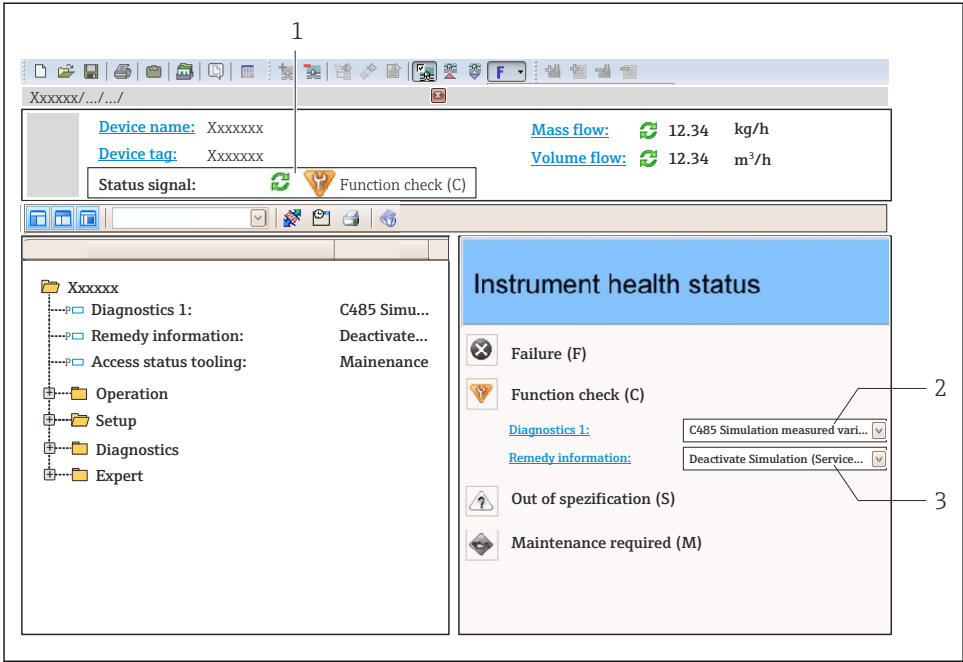
For detailed information on protecting the settings against unauthorized access, see the Operating Instructions for the device.

## 9 Diagnostic information

Any faults detected by the measuring device are displayed as a diagnostic message in the operating tool once the connection has been established and on the home page of the web browser once the user has logged on.

Remedial measures are provided for each diagnostic message to ensure that problems can be rectified quickly.

- In the Web browser: Remedial measures are displayed in red on the home page next to the diagnostic message → 25.
- In FieldCare: Remedial measures are displayed on the home page in a separate field below the diagnostic message: see the Operating Instructions for the device



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- 1 Status area with status signal
- 2 Diagnostic information
- 3 Remedy information with Service ID

► Perform the remedial measure displayed.

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[www.addresses.endress.com](http://www.addresses.endress.com)

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