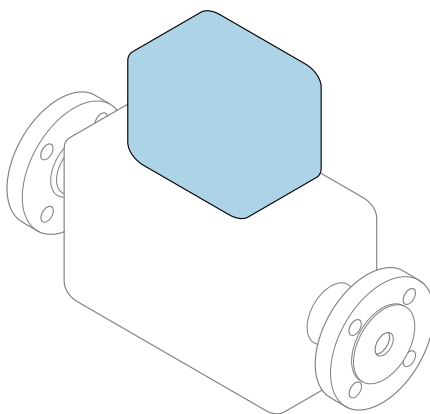


# Brief Operating Instructions

## Proline 400

Transmitter with ultrasonic transit time sensor  
HART

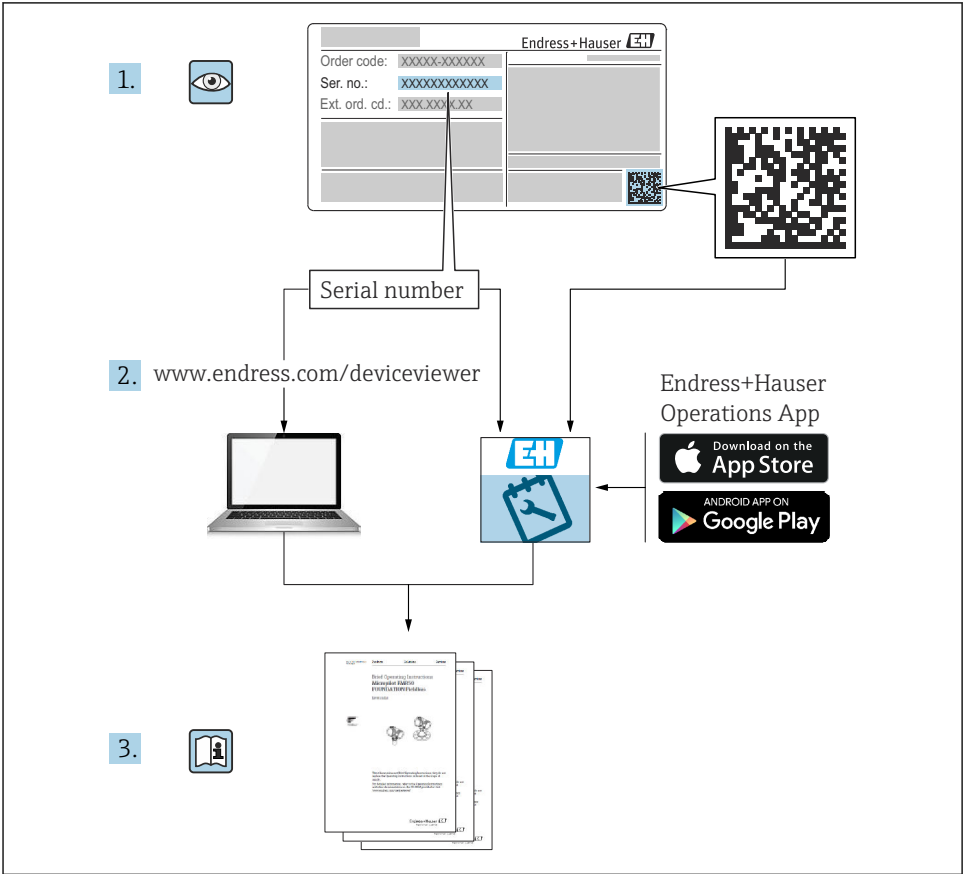


These instructions are Brief Operating Instructions; they are **not** a substitute for the Operating Instructions pertaining to the device.

### **Brief Operating Instructions part 2 of 2: Transmitter**

Contain information about the transmitter.

Brief Operating Instructions part 1 of 2: Sensor →  3



A0023555

## Brief Operating Instructions for flowmeter

The device consists of a transmitter and a sensor.

The process of commissioning these two components is described in two separate manuals that together form the Brief Operating Instructions for the flowmeter:

- Brief Operating Instructions Part 1: Sensor
- Brief Operating Instructions Part 2: Transmitter

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

### Brief Operating Instructions Part 1: Sensor

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

### Brief Operating Instructions Part 2: Transmitter

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 **Brief Operating Instructions Part 2: Transmitter**.

The "Brief Operating Instructions Part 1: Sensor" 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*

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# 1 About this document

## 1.1 Symbols used

### 1.1.1 Safety symbols

**DANGER**

This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.

**WARNING**

This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.











**CAUTION**

This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.





**NOTICE**


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> Procedures, processes or actions that are permitted.		<b>Preferred</b> Procedures, processes or actions that are preferred.
	<b>Forbidden</b> Procedures, processes or actions that are forbidden.		<b>Tip</b> 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> A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.

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







1.1.4 Communication-specific symbols

Symbol	Meaning	Symbol	Meaning
	<b>Wireless Local Area Network (WLAN)</b> Communication via a wireless, local network.		Prosonic Flow 400 <b>Bluetooth</b> Wireless data transmission between devices over a short distance.
	Promag 800 <b>Cellular radio</b> Bidirectional data exchange via cellular network.		<b>LED</b> Light emitting diode is off.
	<b>LED</b> Light emitting diode is on.		<b>LED</b> Light emitting diode is flashing.

1.1.5 Tool symbols

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

1.1.6 Symbols in graphics

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

## 2 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 Intended use

#### Application and media

The measuring device described in this manual is intended only for the 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 in applications where there is an increased risk due to process pressure, are marked accordingly on the nameplate.

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

- ▶ Keep within the specified 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).
- ▶ If the ambient temperature of the measuring device is outside the atmospheric temperature, it is absolutely essential to comply with the relevant basic conditions as specified in the device documentation.
- ▶ 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.

#### Residual risks

##### **WARNING**

**If the temperature of the media or electronics unit is high or low, this may cause the surfaces of the device to become hot or cold. This poses a risk of burns or frostbite!**

- ▶ In the case of hot or cold medium temperatures, install appropriate protection against contact.

## 2.3 Workplace safety

For work on and with the device:

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

If mounting the sensors and tensioning bands:

- ▶ Due to the increased risk of cuts, wear suitable gloves and protective goggles.

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, wear suitable gloves.

## 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.

Furthermore, the device meets the legal requirements of the applicable UK regulations (Statutory Instruments). These are listed in the UKCA Declaration of Conformity along with the designated standards.

By selecting the order option for UKCA marking, Endress+Hauser confirms a successful evaluation and testing of the device by affixing the UKCA mark.

Contact address Endress+Hauser UK:

Endress+Hauser Ltd.  
Floats Road  
Manchester M23 9NF  
United Kingdom  
[www.uk.endress.com](http://www.uk.endress.com)

## 2.6 IT security

Our warranty is valid only 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 settings.

IT security measures, which provide additional protection for the device and associated data transfer, must be implemented by the operators themselves in line with their security standards.



## 2.7 Device-specific IT security

The device offers a range of specific functions to support protective measures on the operator's side. These functions can be configured by the user and guarantee greater in-operation safety if used correctly.



For detailed information on device-specific IT security, see the Operating Instructions for the device.


## 3 Product description

The measuring system consists of a transmitter and two or one sensor sets. The transmitter and sensor sets are mounted in physically separate locations. They are interconnected by sensor cables.

- Prosonic Flow I 400: The sensors work as sound generators and sound receivers. The sensors in a sensor pair are always arranged opposite one another and send/receive the ultrasonic signals directly (1-traverse positioning).
- Prosonic Flow W 400: The measuring system uses a method based on the time-of-flight difference. Here, the sensors work as sound generators and sound receivers. Depending on the application and version, the sensors can be arranged for a measurement via 1, 2, 3 or 4 traverses.


The transmitter serves to control the sensor sets, to prepare, process and evaluate the measuring signals, and to convert the signals to the desired output variable.



For detailed information on the product description, see the Operating Instructions for the device →  3

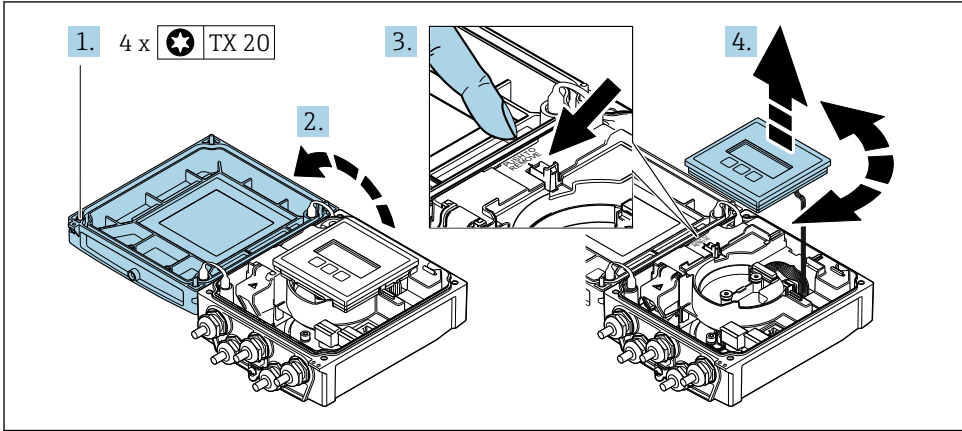
## 4 Mounting



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

## 4.1 Turning the display module

### 4.1.1 Opening the transmitter housing and turning the display module



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1. Loosen the fixing screws of the housing cover.
2. Open the housing cover.
3. Unlock the display module.
4. Pull out the display module and turn it to the desired position in increments of 90°.

### 4.1.2 Mounting the transmitter housing

#### **⚠ WARNING**

**Excessive tightening torque applied to the fixing screws!**

Damage to the transmitter.

- Tighten the fixing screws with the specified torques.

1. Insert the display module and lock it when doing so.
2. Close the housing cover.
3. Tighten the fixing screws of the housing cover: tightening torque for aluminum housing 2.5 Nm (1.8 lbf ft) – plastic housing 1 Nm (0.7 lbf ft).

## 4.2 Special mounting instructions

### 4.2.1 Display guard

- To ensure that the display guard can be easily opened, maintain the following minimum head clearance: 350 mm (13.8 in)

### 4.3 Transmitter post-installation check

The post-installation check must always be performed after the following tasks:

- Turning the transmitter housing
- Turning the display module

Is the device undamaged (visual inspection)?	<input type="checkbox"/>
Turning the transmitter housing: <ul style="list-style-type: none"><li>■ Is the fixing screw firmly tightened?</li><li>■ Is the connection compartment cover screwed on tightly?</li><li>■ Is the securing clamp firmly tightened?</li></ul>	<input type="checkbox"/>
Turning the display module: <ul style="list-style-type: none"><li>■ Is the connection compartment cover screwed on tightly?</li><li>■ Is the securing clamp firmly tightened?</li></ul>	<input type="checkbox"/>

## 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 Electrical safety

In accordance with applicable national regulations.

### 5.2 Connection conditions

#### 5.2.1 Required tools

- Torque wrench
- For cable entries: Use corresponding tools
- Wire stripper
- When using stranded cables: Crimper for wire end ferrule

#### 5.2.2 Requirements for connecting cable

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

##### **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 (incl. conductor for the inner ground terminal)**

Standard installation cable is sufficient.

##### **Signal cable**

*Current output 0/4 to 20 mA*

Standard installation cable is sufficient.

*Current output 4 to 20 mA HART*

A shielded cable is recommended. Observe grounding concept of the plant.

*Pulse/frequency/switch output*

Standard installation cable is sufficient.

*Status input*

Standard installation cable is sufficient.

## Sensor cable for sensor - transmitter

<b>Standard cable</b>	<ul style="list-style-type: none"> <li>■ TPE: -40 to +80 °C (-40 to +176 °F)</li> <li>■ TPE halogen-free: -40 to +80 °C (-40 to +176 °F)</li> <li>■ PTFE: -40 to +130 °C (-40 to +266 °F)</li> </ul>
<b>Cable length (max.)</b>	30 m (90 ft)
<b>Cable lengths (available for order)</b>	5 m (15 ft), 10 m (30 ft), 15 m (45 ft), 30 m (90 ft)
<b>Operating temperature</b>	Depends on the device version and how the cable is installed: Standard version: <ul style="list-style-type: none"> <li>■ Cable, fixed installation <sup>1)</sup>: minimum -40 °C (-40 °F)</li> <li>■ Cable, movable: minimum -25 °C (-13 °F)</li> </ul>

1) Compare details under the "Standard cable" row

### Cable diameter

- Cable glands supplied:
  - For standard cable: M20 × 1.5 with cable  $\phi$  6 to 12 mm (0.24 to 0.47 in)
  - For reinforced cable: M20 × 1.5 with cable  $\phi$  9.5 to 16 mm (0.37 to 0.63 in)
- (Plug-in) spring terminals for wire cross-sections 0.5 to 2.5 mm<sup>2</sup> (20 to 14 AWG)

### 5.2.3 Terminal assignment

#### Transmitter

The sensor can be ordered with terminals.

Connection methods available		Possible options for order code "Electrical connection"
Outputs	Power supply	
Terminals	Terminals	<ul style="list-style-type: none"> <li>■ Option A: coupling M20x1 M20x1.5</li> <li>■ Option B: thread M20x1 M20x1.5</li> <li>■ Option C: thread G ½"</li> <li>■ Option D: thread NPT ½"</li> </ul>

### Supply voltage

Order code "Power supply"	Terminal numbers	terminal voltage		Frequency range
Option L (wide range power unit)	1 (L+/L), 2 (L-/N)	DC 24 V	±25%	–
		AC 24 V	±25%	50/60 Hz, ±4 Hz
		AC 100 to 240 V	-15 to +10%	50/60 Hz, ±4 Hz

Signal transmission for current output 0 to 20 mA/4 to 20 mA HART and other outputs and inputs

Order code for "Output" and "Input"	Terminal numbers							
	Output 1		Output 2		Output 3		Input	
	26 (+)	27 (-)	24 (+)	25 (-)	22 (+)	23 (-)	20 (+)	21 (-)
Option H	Current output <ul style="list-style-type: none"><li>4 to 20 mA HART (active)</li><li>0 to 20 mA (active)</li></ul>		Pulse/frequency output (passive)		Switch output (passive)		-	
Option I	Current output <ul style="list-style-type: none"><li>4 to 20 mA HART (active)</li><li>0 to 20 mA (active)</li></ul>		Pulse/frequency/switch output (passive)		Pulse/frequency/switch output (passive)		Status input	

5.2.4 Preparing the measuring device

Carry out the steps in the following order:

1. Mount the sensor and transmitter.
2. Sensor connection housing: Connect sensor cable.
3. Transmitter: Connect sensor cable.
4. Transmitter: Connect signal cable and cable for supply voltage.

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 → 12.

## 5.3 Connecting the measuring device

### **WARNING**

#### **Risk of electric shock! Components carry dangerous voltages!**

- ▶ Have electrical connection work carried out by correspondingly trained specialists only.
- ▶ Observe applicable federal/national installation codes and regulations.
- ▶ Comply with local workplace safety regulations.
- ▶ Observe grounding concept of the plant.
- ▶ Never mount or wire the measuring device while it is connected to the supply voltage.
- ▶ Before the supply voltage is applied, connect the protective ground to the measuring device.

### 5.3.1 Connecting the sensor and transmitter

#### **WARNING**

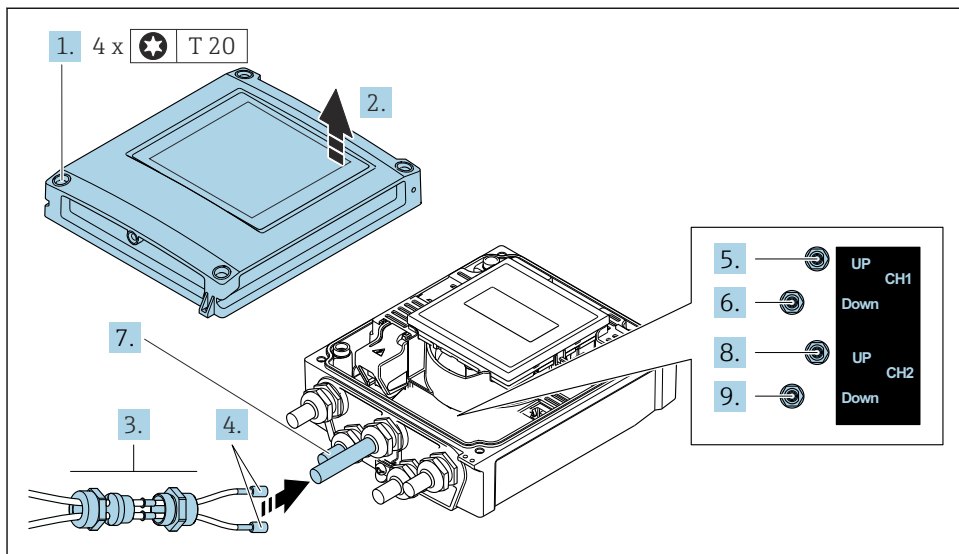
#### **Risk of damaging electronic components!**

- ▶ Connect the sensor and transmitter to the same potential equalization.
- ▶ Only connect the sensor to a transmitter with the same serial number.

The following sequence of steps is recommended when connecting:

1. Mount the sensor and transmitter.
2. Connect the sensor cable.
3. Connect the transmitter.

## Connecting the sensor cable to the transmitter



A0046768

 1 Transmitter: main electronics module with terminals

1. Loosen the 4 fixing screws on the housing cover.
2. Open the housing cover.
3. Route the two sensor cables of channel 1 through the slackened top union nut of the cable entry. To ensure tight sealing, mount a sealing insert on the sensor cables (push the cables through the slotted sealing insert).
4. Mount the screw part in the center cable entry at the top and then guide both sensor cables through the entry. Then fit the coupling nut with the sealing insert on the screw part and tighten. Ensure that the sensor cables are positioned in the cut-outs provided in the screw part.
5. Connect sensor cable to channel 1 upstream.
6. Connect sensor cable to channel 1 downstream.
7. For a two-path measurement: proceed as per steps 3+4
8. Connect sensor cable to channel 2 upstream.
9. Connect sensor cable to channel 2 downstream.
10. Tighten the cable gland(s).
  - ↳ This concludes the process for connecting the sensor cable(s).



11.



**Housing degree of protection may be voided due to insufficient sealing of the housing.**

- Screw in the screw without using any lubricant.

Reverse the removal procedure to reassemble the transmitter.

### 5.3.2 Connecting the transmitter

#### **⚠ WARNING**

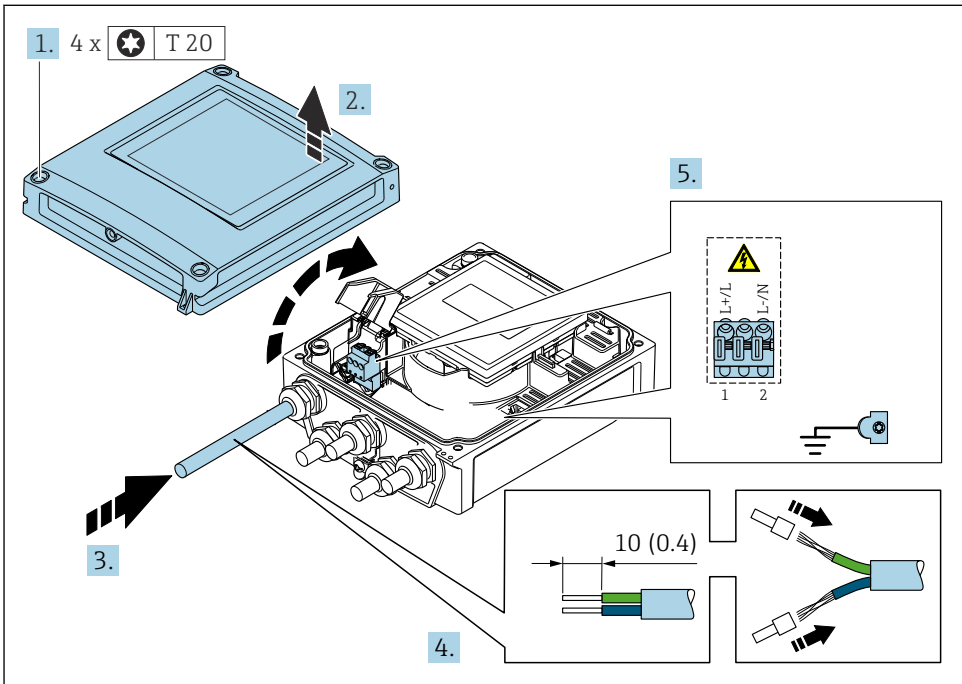
**Housing degree of protection may be voided due to insufficient sealing of the housing.**

- Screw in the screw without using any lubricant. The threads on the cover are coated with a dry lubricant.

#### *Tightening torques for plastic housing*

Housing cover fixing screw	1 Nm (0.7 lbf ft)
Cable entry	5 Nm (3.7 lbf ft)
Ground terminal	2.5 Nm (1.8 lbf ft)

**i** When connecting the cable shield to the ground terminal, observe the grounding concept of the facility.



A0046769

**2** Connecting the supply voltage and 0-20 mA/4-20 mA HART with additional outputs and inputs

1. Loosen the 4 fixing screws on the housing cover.
2. Open the housing cover.
3. Push the cable through the cable entry. To ensure tight sealing, do not remove the sealing ring from the cable entry.

4. Strip the cable and cable ends. In the case of stranded cables, also fit ferrules.
5. Connect the cables according to the connection nameplate on the main electronics module, for supply voltage: open the shock protection cover.
6. Firmly tighten the cable glands.

### Reassembling the transmitter

1. Close the shock protection cover.
2. Close the housing cover.
3. **⚠ WARNING**

**Housing degree of protection may be voided due to insufficient sealing of the housing.**

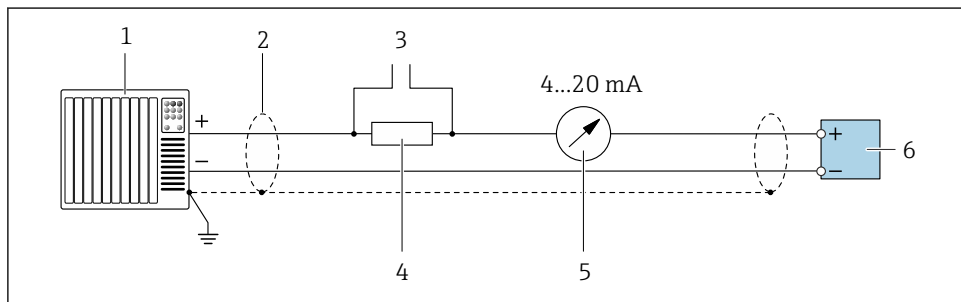
- Screw in the screw without using any lubricant.

Tighten the 4 fixing screws on the housing cover.

## 5.4 Special connection instructions

### 5.4.1 Connection examples

#### Current output 4 to 20 mA HART

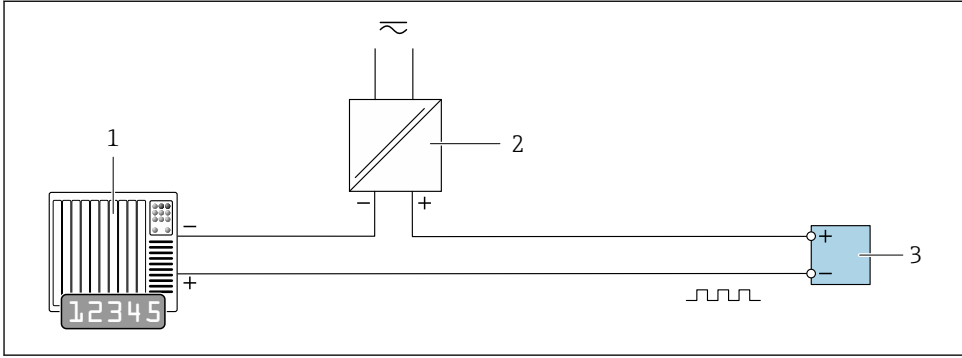


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#### 3 Connection example for 4 to 20 mA HART current output (active)

- 1 Automation system with current input (e.g. PLC)
- 2 Ground the cable shield at one end. The cable shield must be grounded at both ends to comply with EMC requirements; observe cable specifications
- 3 Connection for HART operating devices
- 4 Resistor for HART communication ( $\geq 250 \Omega$ ): observe maximum load
- 5 Analog display unit: observe maximum load
- 6 Transmitter

## Pulse/frequency output

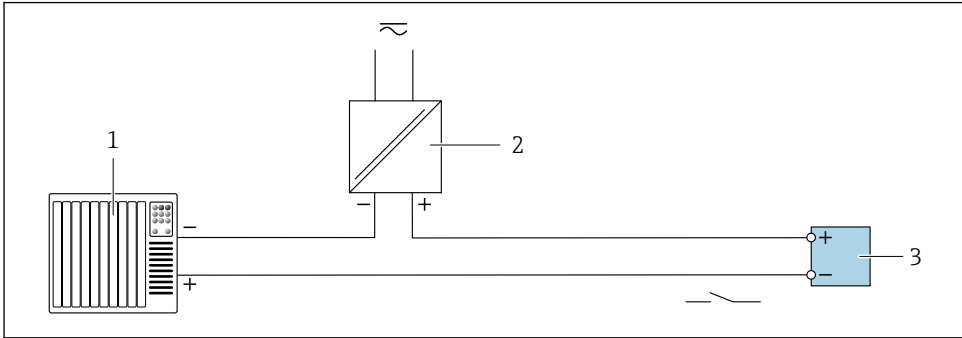


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4 Connection example for pulse/frequency output (passive)

- 1 Automation system with pulse/frequency input (e.g. PLC)
- 2 Power supply
- 3 Transmitter: Observe input values

## Switch output

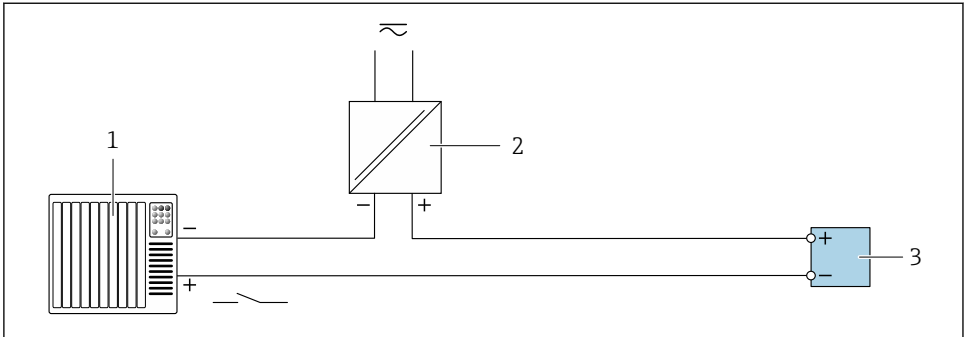


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5 Connection example for switch output (passive)

- 1 Automation system with switch input (e.g. PLC)
- 2 Power supply
- 3 Transmitter: Observe input values

## Status input



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6 Connection example for status input

- 1 Automation system with status output (e.g. PLC)
- 2 Power supply
- 3 Transmitter

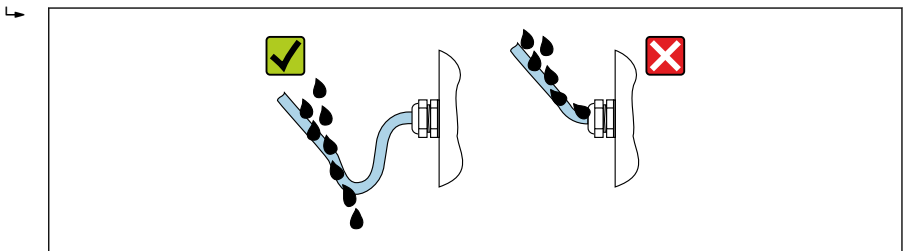
## 5.5 Ensuring the degree of protection

### 5.5.1 Degree of protection IP66/67, Type 4X enclosure

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. Dry, clean or replace the seals if necessary.
2. Tighten all housing screws and screw covers.
3. Firmly tighten the cable glands.
4. To ensure that moisture does not enter the cable entry, route the cable so that it loops down before the cable entry ("water trap").



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5.
- Insert dummy plugs (corresponding to the housing degree of protection) into unused cable entries.

NOTICE

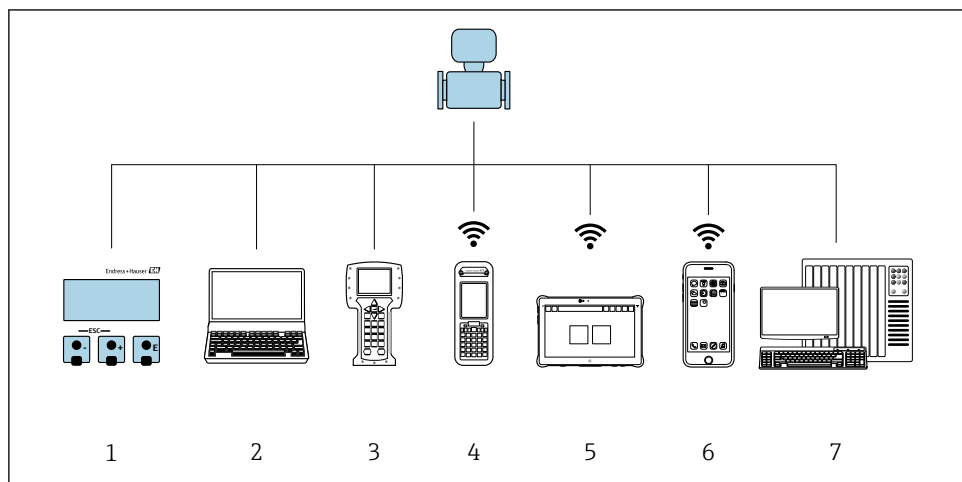
**Standard dummy plugs used for transportation do not have the appropriate degree of protection and can result in damage to the device!**  
► Use suitable dummy plugs corresponding to the degree of protection.

5.6 Post-connection check

Are cables or the device undamaged (visual inspection)?	<input type="checkbox"/>
Do the cables comply with the requirements → 12?	<input type="checkbox"/>
Do the cables have adequate strain relief?	<input type="checkbox"/>
Are all cable glands installed, securely tightened and leak-tight? Cable run with "water trap" → 21?	<input type="checkbox"/>
Does the supply voltage match the specifications on the transmitter nameplate ?	<input type="checkbox"/>
Is the terminal assignment correct → 13?	<input type="checkbox"/>
If supply voltage is present, do values appear on the display module?	<input type="checkbox"/>
Are all housing covers installed and the screws tightened with the correct tightening torque?	<input type="checkbox"/>

## 6 Operation options

### 6.1 Overview of operation methods

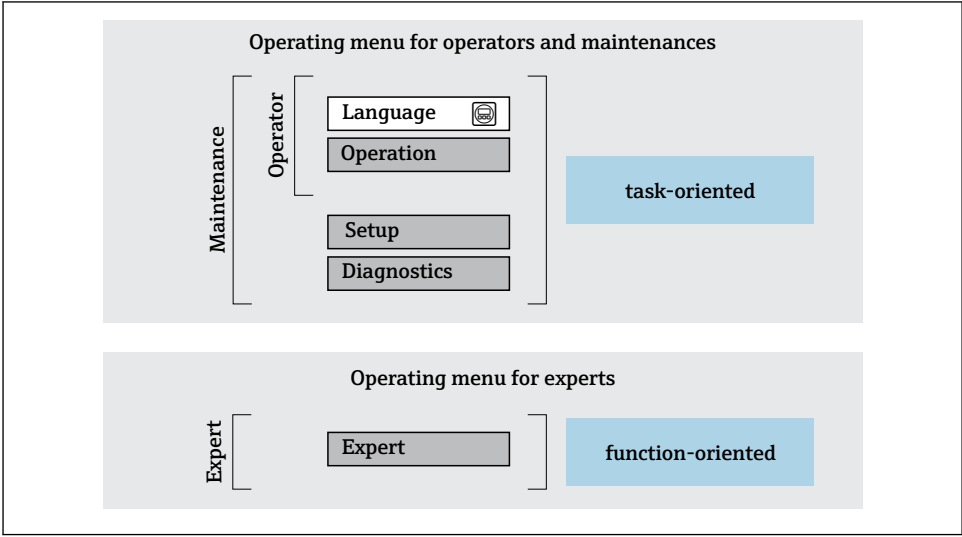


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- 1 Local operation via display module
- 2 Computer with Web browser (e.g. Internet Explorer) or with operating tool (e.g. FieldCare, DeviceCare, AMS Device Manager, SIMATIC PDM)
- 3 Field Communicator 475
- 4 Field Xpert SFX350 or SFX370
- 5 Field Xpert SMT70
- 6 Mobile handheld terminal
- 7 Control system (e.g. PLC)

## 6.2 Structure and function of the operating menu

### 6.2.1 Structure of the operating menu



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 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 scope

Thanks to the integrated Web server the device can be operated and configured via a Web browser and via a standard Ethernet switch (RJ45) or via a WLAN interface. The structure of the operating menu is the same as the menu on the local display. In addition to the measured values, status information about 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.

A device that has a WLAN interface (can be ordered as an option) is required for the WLAN connection: order code for "Display", option G "4-line, illuminated; Touch Control +WLAN". The device acts as an Access Point and enables communication by computer or a mobile handheld terminal.




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

### 6.3.2 Requirements


#### Computer hardware

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

#### Computer software

Recommended operating systems	Microsoft Windows 7 or higher.  Microsoft Windows XP is supported.
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 proxy server for LAN</i> must be <b>disabled</b> .
JavaScript	JavaScript must be enabled.  If JavaScript cannot be enabled: enter <code>http://192.168.1.212/basic.html</code> in the address line of the Web browser. A fully functional but simplified version of the operating menu structure starts in the Web browser.

Network connections	Only the active network connections to the measuring device should be used.
	Switch off all other network connections such as WLAN.

*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

*Measuring device: via WLAN interface*

Device	WLAN interface
Measuring device	The measuring device has a WLAN antenna: Transmitter with integrated WLAN antenna
Web server	Web server and WLAN 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

## Via WLAN interface

*Configuring the Internet protocol of the mobile terminal*

### NOTICE

**If the WLAN connection is lost during the configuration, settings made may be lost.**

- ▶ Make sure that the WLAN connection is not disconnected while configuring the device.

### NOTICE

**In principle, avoid simultaneous access to the measuring device via the service interface (CDI-RJ45) and the WLAN interface from the same mobile terminal. This could cause a network conflict.**

- ▶ Only activate one service interface (CDI-RJ45 service interface or WLAN interface).
- ▶ If simultaneous communication is necessary: configure different IP address ranges, e.g. 192.168.0.1 (WLAN interface) and 192.168.1.212 (CDI-RJ45 service interface).

*Preparing the mobile terminal*

- ▶ Enable WLAN reception on the mobile terminal.

*Establishing a connection from the mobile terminal to the measuring device*

1. In the WLAN settings of the mobile terminal:  
Select the measuring device using the SSID (e.g. EH\_Prosonic Flow\_400\_A802000).
2. If necessary, select the WPA2 encryption method.
3. Enter the password: serial number of the measuring device ex-works (e.g. L100A802000).
  - ↳ LED on display module flashes: it is now possible to operate the measuring device with the Web browser, FieldCare or DeviceCare.



The serial number can be found on the nameplate.



To ensure the safe and swift assignment of the WLAN network to the measuring point, it is advisable to change the SSID name. It should be possible to clearly assign the SSID name to the measuring point (e.g. tag name) as it is displayed as the WLAN network.


*Disconnecting*

- ▶ After configuring the device:  
Terminate the WLAN connection between the operating unit and measuring device.

## 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
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6.3.5      **User interface**

Device name:

Device tag:

Status signal:

Output curr. 1:

Mass flow:

Volume flow:

6.76 mA

1554.7325 kg/h

15547326.0000 l/h

Correct.vol.flow:


Density:

Ref.density:

15547326.0000 NI/h

0.0001 kg/l

0.0001 kg/NI

Endress+Hauser 

Measured values

Menu

Instrument health status

Data management

Network

Logging

Logout (Maintenance)

Main menu

Display language

English

Operation

Setup

Diagnostics

Expert

1

2

3

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- 1      *Function row*
- 2      *Local display language*
- 3      *Navigation area*

**Header**

The following information appears in the header:

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

**Function row**

Functions	Meaning
Measured values	Displays the measured values of the 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 local display</li></ul> <div> For detailed information on the structure of the operating menu, see the Operating Instructions for the measuring device</div>

Functions	Meaning
Device status	Displays the diagnostic messages currently pending, listed in order of priority
Data management	Data exchange between PC and measuring device: <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> </ul>
Network configuration	Configuration and checking of all the parameters required for establishing the connection to the measuring device: <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
Web server functionality	Switch the Web server on and off.	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ On</li> </ul>

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 local display
- 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) →  26.

6.4 Access to the operating menu via the operating tool

 For detailed information on access via FieldCare and DeviceCare, see the Operating Instructions for the device →  3

7 System integration

 For detailed information on system integration, see the Operating Instructions for the device →  3

- Overview of device description files:
  - Current version data for the device
  - Operating tools
- Measured variables via HART protocol
- Burst mode functionality in accordance with HART 7 Specification

## 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 →  11
- "Post-connection check" checklist →  22

### 8.2 Switching on the measuring device

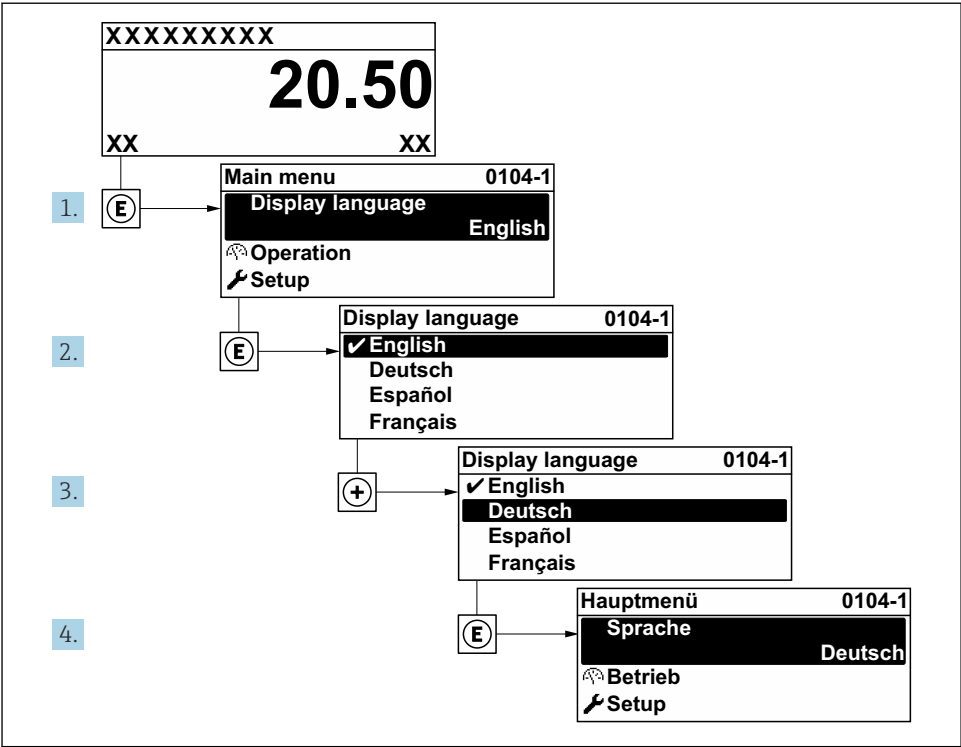
- ▶ After a successful function check, switch on the measuring device.
  - ↳ After a successful startup, the local display switches automatically from the startup display to the operational display.



If nothing appears on the local display or a diagnostic message is displayed, refer to the Operating Instructions for the device →  3

### 8.3 Setting the operating language

Factory setting: English or ordered local language



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8 Taking the example of the local display

8.4 Configuring the measuring device

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

For detailed information on the device parameters, see the Description of Device Parameters → 3

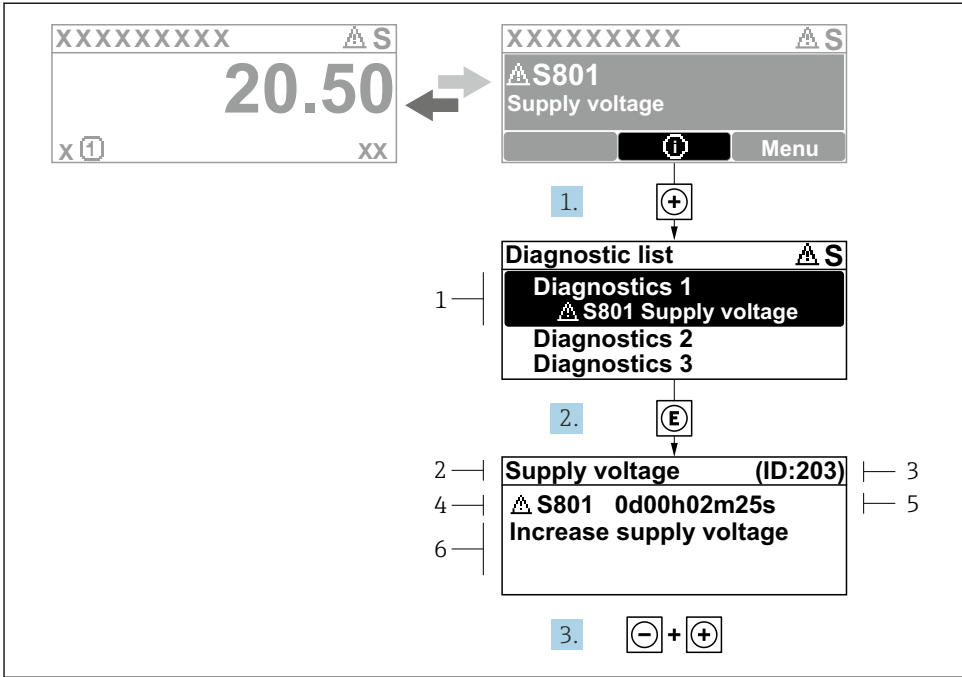
Submenu	Configuration
System	Display, diagnostic settings, administration
Sensor	Measured values, system units, process parameter, sensor adjustment
Measuring point	Configuration of the measuring point
Installation status	Configuration of the installation status
Input	Status input
Output	Current output, pulse/frequency/switch output



Submenu	Configuration
Communication	HART input, HART output, web server, diagnostic configuration, WLAN settings
Application	Totalizer
Diagnosis	Diagnostics list, event logbook, device information, simulation

## 9 Diagnostic information

Faults detected by the self-monitoring system of the measuring device are displayed as a diagnostic message in alternation with the operational display. The message about remedial measures can be called up from the diagnostic message, and contains important information on the fault.



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## 9 Message about remedial measures

- 1 Diagnostic information
- 2 Short text
- 3 Service ID
- 4 Diagnostic behavior with diagnostic code
- 5 Operation time of occurrence
- 6 Remedial measures

1. The user is in the diagnostic message.  
Press  $\oplus$  (① symbol).  
↳ The **Diagnostic list** submenu opens.
2. Select the desired diagnostic event with  $\oplus$  or  $\ominus$  and press  $\boxplus$ .  
↳ The message about the remedial measures opens.
3. Press  $\ominus + \oplus$  simultaneously.  
↳ The message about the remedial measures closes.

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