Brief Operating Instructions Flowmeter Proline 10

Modbus RS485 transmitter Transmitter with Coriolis sensor



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 $\rightarrow \implies 3$





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
- 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
- Smart phone/tablet: Endress+Hauser Operations App

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1 About this document

1.1 Symbols

1.1.1 Warnings

DANGER

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

WARNING

This symbol alerts you to a potentially dangerous situation. Failure to avoid the situation may result in a fatal or serious injury.

ACAUTION

This symbol alerts you to a potentially dangerous situation. Failure to avoid the situation may result in a minor or mild injury.

NOTICE

This symbol alerts you to a potentially harmful situation. Failure to avoid the situation may result in damage to the facility or to something in the facility's vicinity.

1.1.2 Electronics

- --- Direct current
- \sim Alternating current
- Terminal connection for potential equalization

1.1.3 Device communication

- ***** Bluetooth is enabled.
- LED is off.
- LED flashing.
- EED lit.

1.1.4 Tools

- Flat blade screwdriver
- 🔿 🎻 🛛 Hexagon wrench
- 💅 Wrench

1.1.5 Types of information

- Preferred procedures, processes or actions
- Permitted procedures, processes or actions

- Forbidden procedures, processes or actions
- Additional information
- Reference to documentation
- Reference to page
- Reference to graphic
- Measure or individual action to be observed
- 1., 2.,... Series of steps
- └→ Result of a step
- P Help in the event of a problem
- Visual inspection
- H Write-protected parameter

1.1.6 Explosion protection

- 🔬 Hazardous area
- 🔉 Non-hazardous area

2 Safety instructions

2.1 Requirements for specialist personnel

- Installation, electrical connection, commissioning, diagnostics and maintenance of the device must only be carried out by trained, specialist personnel authorized by the facility's owner-operator.
- Before commencing work, the trained, specialist personnel must carefully read, understand and adhere to the Operating Instructions, additional documentation and certificates.
- Comply with national regulations.

2.2 Requirements for operating personnel

- Operating personnel are authorized by the facility's owner-operator and are instructed according to the requirements of the task.
- Before commencing work, the operating personnel must carefully read, understand and adhere to the instructions provided in the Operating Instructions and additional documentation.

2.3 Incoming acceptance and transport

► Transport the device in a correct and appropriate manner.

2.4 Adhesive labels, tags and engravings

▶ Pay attention to all the safety instructions and symbols on the device.

2.5 Environment and process

- Only use the device for the measurement of appropriate media.
- ► Keep within the device-specific pressure range and temperature range.
- ▶ Protect the device from corrosion and the influence of environmental factors.

2.6 Workplace safety

- Wear the required protective equipment according to national regulations.
- ▶ Do not ground the welding unit by means of the device.
- Wear protective gloves if working on and with the device with wet hands.

2.7 Installation

- Do not remove protective covers or protective caps on the process connections until just before you install the sensor.
- ▶ Do not damage or remove the liner on the flange.
- Observe tightening torques.

2.8 Electrical connection

- ► Comply with national installation regulations and guidelines.
- Observe cable specifications and device specifications.
- Check the cable for damage.
- ▶ If using the device in hazardous areas, observe the "Safety Instructions" documentation.
- ▶ Provide (establish) potential equalization.
- ▶ Provide (establish) grounding.

2.9 Surface temperature

Media with elevated temperatures can cause the surfaces of the device to become hot. For this reason, note the following:

- Mount suitable touch protection.
- Wear suitable protective gloves.

2.10 Commissioning

- ▶ Install the device only if it is in proper technical condition, free from errors and faults.
- Only put the device into operation once you have performed the post-installation check and post-connection check.

2.11 Modifications to the device

- ► Only carry out modifications or repairs after consulting beforehand with an Endress+Hauser service organization.
- ▶ Install spare parts and accessories according to the Installation Instructions.

• Only use original spare parts and original accessories from Endress+Hauser.

3 Product information

3.1 Designated use

The device is intended only for the flow measurement of liquids and gases.

Depending on the version ordered, the device measures potentially explosive, flammable, poisonous and oxidizing media.

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

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

3.2 **Product design**

The transmitter and sensor form a mechanical unit.



- 1 Main device components
- Housing cover 1
- 2 Display module
- 3 Transmitter housing
- 4 Sensor

4 Installation



For detailed information about installing the sensor, see the Brief Operating Instructions for the sensor $\rightarrow \square 3$

4.1 Turning the transmitter housing

Order code for "Housing", option "Aluminum"



Order code for "Housing", option "Polycarbonate"



Loosen the fixing screws on both sides of 1. the transmitter housing.

2. NOTICE

Overrotation of the transmitter housing!

Interior cables are damaged.

 Turn the transmitter housing a maximum of 180° in each direction.

Turn the transmitter housing to the desired position.

- 3. Tighten the screws in the logically reverse sequence.
- Loosen the screw on the housing cover. 1.
- 2. Open the housing cover.
- 3. Loosen the grounding screw (below the display).
- 4. Loosen the fixing screws on both sides of the transmitter housing.

5. NOTICE

Overrotation of the transmitter housing!

Interior cables are damaged.

 Turn the transmitter housing a maximum of 180° in each direction.

Turn the transmitter housing to the desired position.

Tighten the screws in the logically reverse 6. sequence.

4.2 Post-installation check

Is the device undamaged (visual inspection)?	
Does the device comply with the measuring point specifications?	
For example:	
 Process temperature 	
 Process pressure 	
 Ambient temperature 	
Measuring range	
Has the correct orientation been selected for the device?	
Does the direction of the arrow on the device match the flow direction of the medium?	
Is the device protected against precipitation and sunlight?	

5 Electrical connection

5.1 Connection conditions

5.1.1 Notes on the electrical connection

WARNING

Components carry voltage!

Incorrect work performed on the electrical connections can result in an electric shock.

- ► Have electrical connection work carried out by appropriately trained specialists only.
- Comply with applicable federal/national installation codes and regulations.
- Comply with national and local workplace safety regulations.
- Establish the connections in the correct order: always make sure to first connect the protective earth (PE) to the inner ground terminal.
- ▶ When using in hazardous areas, observe the "Safety Instructions" document.
- Ground the device carefully and provide potential equalization.
- Connect protective earthing to all outer ground terminals.

5.1.2 Additional protective measures

The following protective measures are required:

- Set up a disconnecting device (switch or power-circuit breaker) to easily disconnect the device from the supply voltage.
- In addition to the device fuse, include an overcurrent protection unit, with max. 10 A, in the facility installation.
- Plastic sealing plugs act as safeguards during transportation and must be replaced by suitable, individually approved installation material.
- Connection examples:

5.1.3 Connecting the cable shield

- To avoid power (mains) frequency equalizing currents over the cable shield, the potential equalization of the facility must be ensured. If potential equalization (equipotential bonding) of the facility is not possible, only connect the cable shield to the facility on one side. Shielding against electromagnetic interference is then only partially ensured.
- 1. Keep stripped and twisted cable shields to the inner ground terminal as short as possible.
- 2. Shield cables fully.
- 3. Connect the cable shield to the potential equalization of the facility on both sides.

5.2 Requirements for connecting cable

5.2.1 Electrical safety

As per applicable national regulations.

5.2.2 Permitted temperature range

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

5.2.3 Power supply cable (incl. conductor for the inner ground terminal)

- A standard installation cable is sufficient.
- Provide grounding according to applicable national codes and regulations.

5.2.4 Signal cable

- Modbus RS485: Cable type A according to EIA/TIA-485 standard is recommended
- Current output 4 to 20 mA: Standard installation cable

5.3 Connecting the transmitter

5.3.1 Transmitter terminal connections



- 1 Cable entry for power supply cable: supply voltage
- 2 Outer ground terminal: on transmitters made of polycarbonate with a metal pipe adapter
- 3 Cable entry for signal cable
- 4 Outer ground terminal



- 1 Cable entry for power supply cable: supply voltage
- 2 Cable entry for signal cable
- *3* Outer ground terminal

5.3.2 Terminal assignment

The terminal assignment is documented on an adhesive label.

The following terminal assignment is available:

Modbus RS485 and current output 4 to 20 mA (active)

Supply	voltage	Output 1				Output 2	
1 (+)	2 (-)	26 (+)	27 (-)	24 (+)	25 (-)	22 (B)	23 (A)
Ľ/+	N/-	Current output 4 to 20 mA (active)		-	_	Modbus	s RS485

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Modbus RS485 and current output 4 to 20 mA (passive)

Supply	voltage	Output 1				Output 2	
1 (+)	2 (-)	26 (+)	27 (-)	24 (+)	25 (-)	22 (B)	23 (A)
L/+	N/-	_		Current 4 to 20 mA	: output A (passive)	Modbus	s RS485

5.3.3 Wiring the transmitter

- Use a suitable cable gland for the power supply cable and signal cable.
 - Pay attention to the requirements for the power supply cable and signal cable $\rightarrow~\textcircled{}$ 12 .
 - Use shielded cables for digital communication.

NOTICE

If the cable gland is incorrect, this compromises the sealing of the housing! Damage to the device.

• Use a suitable cable gland corresponding to the degree of protection.







- **1.** Ground the device carefully and provide potential equalization.
- 2. Connect protective earthing to the outer ground terminals.

- 3. Loosen the Allen key of the securing clamp.
- 4. Open the housing cover counterclockwise.

- 5. Press the tab of the display module holder.
- 6. Remove the display module from the display module holder.



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- The cable must be in the tab for strain relief.
- 7. Let the display module hang down.

8. Remove dummy plug if present.

NOTICE

If the sealing ring is missing, the housing is not sealed tight!

Damage to the device.

- Do not remove the sealing ring from the cable entry.
- **9.** Feed the power supply cable and signal cable through the corresponding cable entry.
- **10.** Strip the cable and cable ends.
- **11.** Fit ferrules over the strands and press in place.
- The terminal assignment is documented on an adhesive label.
- 12. Connect the protective ground (PE) to the inner ground terminal.
- **13.** Connect the power supply cable and signal cable as per the terminal assignment.
- 14. Connect the cable shields to the inner ground terminal.
- 15. Tighten the cable glands.
- **16.** Follow the sequence in the reverse order to reassemble.

5.4 Removing a cable



- 1. Use a flat-blade screwdriver to press down on the slot between the two terminal holes and hold.
- 2. Remove the cable end from the terminal.

Engineering unit mm (in)

5.5 Ensuring potential equalization

No special measures for potential equalization are required.



For devices intended for use in hazardous areas, observe the instructions in the Ex documentation (XA).

5.6 Hardware settings

5.6.1 Enabling write protection



5.7 Post-connection check

Is the protective earthing established correctly?			
Are the device and cable undamaged (visual check)?			
Do the cables meet the requirements?			
Is the terminal assignment correct?			
Are all the cable glands installed, firmly tightened and leak-tight?			
Are dummy plugs inserted in unused cable entries?			
Are transportation plugs replaced by dummy plugs?			
Are the housing screws and housing cover tightened?			
Do the cables loop down before the cable gland ('water trap')?			
Does the supply voltage match the specifications on the transmitter nameplate?			

6 Operation



6.1 Overview of the operating options

- 1 Local operation via touch screen
- 2 Computer with operating tool, e.g. FieldCare, DeviceCare, AMS Device Manager, SIMATIC PDM
- 3 Field Xpert SFX350 or SFX370 via Bluetooth
- 4 Field Xpert SMT70 via Bluetooth
- 5 Tablet or smartphone via Bluetooth
- 6 Automation system, e.g. PLC

6.2 Local operation

6.2.1 Unlocking local operation

Local operation must first be unlocked before the device can be operated via the touch screen. To unlock, draw the pattern "L" on the touch screen.



6.2.2 Navigation



Tap

- Open menus.
- Select items in a list.
- Acknowledge buttons.
- Enter characters.



Swipe horizontally

Display next or previous page.



Swipe vertically

Display additional points in a list.

6.2.3 Operational display

During routine operation, the local display shows the operational display screen. The operational display consists of several windows which the user can toggle between.

The operational display can be customized: see the description of parameters $\rightarrow \square 24$.

Operational display and navigation



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- 1 Quick access
- 2 Status symbols, communication symbols and diagnostic symbols
- 3 Measured values
- 4 Rotating page display

Symbols

Open the main menu.

- Quick access
- A Locking status
- Bluetooth is active.
- ← Device communication is enabled.
- 👽 🛛 Status signal: function check
- Status signal: maintenance required
- Status signal: out of specification
- 🛞 Status signal: failure
- Status signal: diagnostics active.

6.2.4 Quick access

The Quick access menu contains a selection of specific device functions.

Quick access is indicated by a triangle at the top of the local display in the middle.

Quick access and navigation



1 Quick access

2 Quick access with specific device functions



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- Back to operational display.
- Open specific device functions.

Symbols

When a symbol is tapped, the local display shows the menu with the corresponding specific device functions.

* Enable or disable Bluetooth.

- பீ Enter access code.
- Hereich Write protection is enabled.
- \times Back to operational display.

6.2.5 Main menu

The main menu contains all the menus required for the commissioning, configuration and operation of the device.

Main menu and navigation



1 Open the main menu.

2 Open menus for the specific device functions.



Тар

- Back to operational display.
- Open menus.

Symbols

- 合 Back to operational display.
- 号 Guidance menu Configuration of the device
- ✓ Diagnostics menu Troubleshooting and control of device behavior
- Application menu Application-specific adjustments
- System menu
 Device management and user administration
- Set display language.

Submenus and navigation





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- Open the main menu.
- Open submenus or parameters.
- Select options.
- Skip items in list.



Swipe vertically

Select items in a list on a step-by-step basis.

Symbols

- < Return to previous menu.
- Skip to bottom of list.
- Skip to top of list.

6.2.6 Diagnostic information

Diagnostic information displays additional instructions or background information for diagnostic events.

Opening the diagnostic message



The diagnostic behavior is indicated on the top right of the local display by a diagnostics symbol. Tap the symbol or the "Help" button to open the diagnostic message.



1 Device status

- 2 Diagnostic behavior with diagnostic code
- 3 Short text
- 4 Open the troubleshooting measures.

6.2.7 Editing view

Editor and navigation

The text editor is used to enter characters.



6 Input field



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• Enter characters.

• Select next character set.



Swipe horizontally

Display next or previous page.

Input field



6.2.8 Date

The device has a real-time clock for all log functions. The time can be configured here.



- 1 Increase date by 1.
- 2 Actual value
- 3 Decrease date by 1.
- 4 Confirm settings.
- 5 Cancel editor.



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- Make settings.
- Confirm settings.
- Cancel editor.

6.3 SmartBlue app

The device has a Bluetooth interface and can be operated and configured using the SmartBlue App. The SmartBlue App must be downloaded onto a terminal device for this purpose. Any terminal device can be used.

- The range is 20 m (65.6 ft) under reference conditions.
- Incorrect operation by unauthorized persons is prevented by means of encrypted communication and password encryption.
- Bluetooth can be disabled.

Download	Endress+Hauser SmartBlue App:			
	Google Playstore (Android)iTunes Apple Shop (iOS devices)			
	ANDROID APP ON Google Play Download on the App Store			
Supported functions	 Configuration of the device Access to measured values, device status and diagnostic information 			

Downloading the SmartBlue app:

- 1. Install and start the SmartBlue app.
 - A Live List shows all the devices available. The list displays the devices with the configured tag name. The default setting of the device tag is EH_**BB_XXYYZZ (XXYYZZ = the first 6 characters of the device serial number).
- 2. For Android devices, activate GPS positioning (not necessary for devices with IOS)
- 3. Select the device from the Live List.
 - └ The Login dialog box opens.
- For energy-saving reasons, if the device is not powered by a power unit, it is only visible in the live list for 10 seconds every minute.
 - The device appears immediately in the live list if the local display is touched for 5 seconds.
 - The device with the highest signal strength appears at the very top of the live list.

Logging in:

- 4. Enter the user name: admin
- 5. Enter the initial password: serial number of the device.
 - ↓ When you log in for the first time, a message is displayed advising you to change the password.
- 6. Confirm your entry.
 - └ The main menu opens.
- **7.** Optional: Change Bluetooth[®] password: System → Connectivity → Bluetooth configuration → Change Bluetooth password



Forgotten your password: contact Endress+Hauser Service.

Performing a firmware update via the SmartBlue app

The flash file must be uploaded to the desired terminal (e.g. smartphone) beforehand.

- 1. In the SmartBlue app: open system.
- 2. Open the software configuration.
- 3. Open the firmware update.
 - └ The wizard now guides you through the firmware update.

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
- Compatibility with previous model
- Modbus RS485 information
 - Function codes
 - Response time
 - Modbus data map

8 Commissioning

8.1 Post-installation check and post-connection check

Before commissioning the device, make sure that the post-installation and post-connection checks have been performed:

- Post-installation check $\rightarrow \square 11$
- Post-connection check $\rightarrow \cong 20$

8.2 Switching on the device

- Switch on the supply voltage for the device.
 - └ The local display switches from the start screen to the operational display.



If device startup is not successful, the device displays an error message to this effect .

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8.3 Commissioning the device

8.3.1 Local operation

P Detailed information on local operation:

1. Via the "Menu" symbol, open the main menu.



2. Via the "Language" symbol, select the desired language.



3. Via the "Guidance" symbol, open the **Commissioning** wizard.







5. Follow the instructions on the local display.

└ The Commissioning wizard goes through all the device parameters that are necessary to commission the device.

For detailed information, see the "Description of Device Parameters" document pertaining to the device.

8.3.2 SmartBlue App

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Information on the SmartBlue App $\rightarrow \cong 28$.

Connecting the SmartBlue App to the device

- 1. Enable Bluetooth on the mobile handheld terminal, tablet or smartphone.
- 2. Start the SmartBlue App.
 - ← A Live List shows all the devices available.
- 3. Select the desired device.
 - └ The SmartBlue App shows the device login.
- 4. Under user name, enter admin.
- 5. Under password, enter the device's serial number. See nameplate for serial number.
- 6. Confirm your entries.
 - └ The SmartBlue App connects to the device and displays the main menu.

Opening the "Commissioning" wizard

- 1. Via the **Guidance** menu, open the **Commissioning** wizard.
- 2. Follow the instructions on the local display.
 - ← The **Commissioning** wizard goes through all the device parameters that are necessary to commission the device.

8.4 Protecting settings from unauthorized access

8.4.1 Write protection switch

Write access to the entire operating menu can be locked via the write protection switch. The values of the parameters cannot be changed. Write protection is disabled when the device leaves the factory.

Write protection is enabled with the write protection switch on the back of the display module.

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

9 Diagnostics and troubleshooting

9.1 Diagnostic information on local display

9.1.1 Diagnostic message

The local display alternates between displaying faults as a diagnostic message and displaying the operational display screen.



- A Operational display in alarm condition
- *B* Diagnostic message
- 1 Diagnostic behavior
- 2 Status signal
- 3 Diagnostic behavior with diagnostic code
- 4 Short text
- 5 Open information on remedial measures.

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



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