

Brief Operating Instructions

FieldPort SWA50

Intelligent Bluetooth® adapter for HART field devices



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1 About this document

1.1 Document function

The Brief Operating Instructions contain all the essential information from incoming acceptance to initial commissioning.

1.2 Symbols

1.2.1 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.

1.2.2 Symbols for certain types of information

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

1.3 Valid versions

Component	Version
Software	V1.01.xx
Hardware	V1.00.xx


1.4 Documentation

Current documentation such as Operating Instructions, certificates and approvals for the product are available at www.endress.com on the relevant product page:

1. Select the product using the filters and search field.
2. Open the product page.
3. Select **Downloads**.

Ex documentation

All explosion-protection data are provided in separate Ex documentation. The relevant Ex documentation is delivered with the Ex devices as standard.

 If there is additional documentation for the device version, the documentation code of this supplementary documentation is specified on the nameplate.

2 Basic safety instructions

2.1 Requirements for personnel

Personnel must meet the following requirements to perform its tasks:

- ▶ Trained, qualified specialists: must have a relevant qualification for this specific role and task and have been trained by Endress+Hauser. Experts at the Endress+Hauser service organization.
- ▶ Personnel must be authorized by the plant owner/operator.
- ▶ Personnel must be familiar with regional and national regulations.
- ▶ Before starting work: personnel must read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application).
- ▶ Personnel must follow instructions and comply with general policies.

2.2 Designated use

The FieldPort SWA50 is a loop-powered adapter that converts the HART signal of the connected HART field device into a reliable and encrypted Bluetooth signal. The FieldPort SWA50 can be retrofitted to all 2-wire or 4-wire HART field devices.

The Bluetooth signal may not be used to replace the wiring in the case of safety applications with a control function.

Incorrect use

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

2.3 Workplace safety

When working on and with the device:

- ▶ Wear the required personal protective equipment as per national regulations.

2.4 Operational safety

Risk of injury!

- ▶ Operate the device only if it is in proper technical condition, free from errors and faults.
- ▶ The operator is responsible for interference-free operation of the device.

2.5 Product safety

This 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.

The device fulfills general safety requirements and legal requirements. It also complies with the EU/EC 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.




For detailed information, see the Security Manual SD02984S
(www.endress.com/SWA50)

2.7 Device-specific IT security

2.7.1 Access via Bluetooth® wireless technology

Signal transmission via Bluetooth® wireless technology uses a cryptographic technique tested by Fraunhofer AISEC.

- Connection via Bluetooth® is not possible without specific Endress+Hauser devices or the *SmartBlue app*.
- Only one point-to-point connection between **one** FieldPort SWA50 device and **one** smartphone or tablet is established.
- The *Bluetooth®* wireless technology interface can be protected incrementally by means of hardware locking. →  29
- The hardware locking cannot be disabled or bypassed using operating tools.

3 Product description

3.1 Function

The FieldPort SWA50 converts the HART signal of the connected HART field device into a reliable and encrypted Bluetooth® or WirelessHart signal. The FieldPort SWA50 can be retrofitted to all 2-wire or 4-wire HART field devices.

The following operating tools are available for the FieldPort SWA50:

- The Endress+Hauser SmartBlue app for mobile devices
- An Endress+Hauser Field Xpert SMTxx tablet PC
- The Endress+Hauser FieldCare SFE500 field device configuration tool

Depending on the operating tool, the following functions are available:

- Configuration of the FieldPort SWA50
- Visualization of the measured values of the connected HART field device
- Visualization of the current status of the FieldPort SWA50 and the connected HART field device
- Configuration of the connected HART field device

HART field devices can be connected to the Netilion Cloud via the FieldPort SWA50 and a FieldEdge device.



Detailed information on Netilion Cloud: <https://netilion.endress.com>

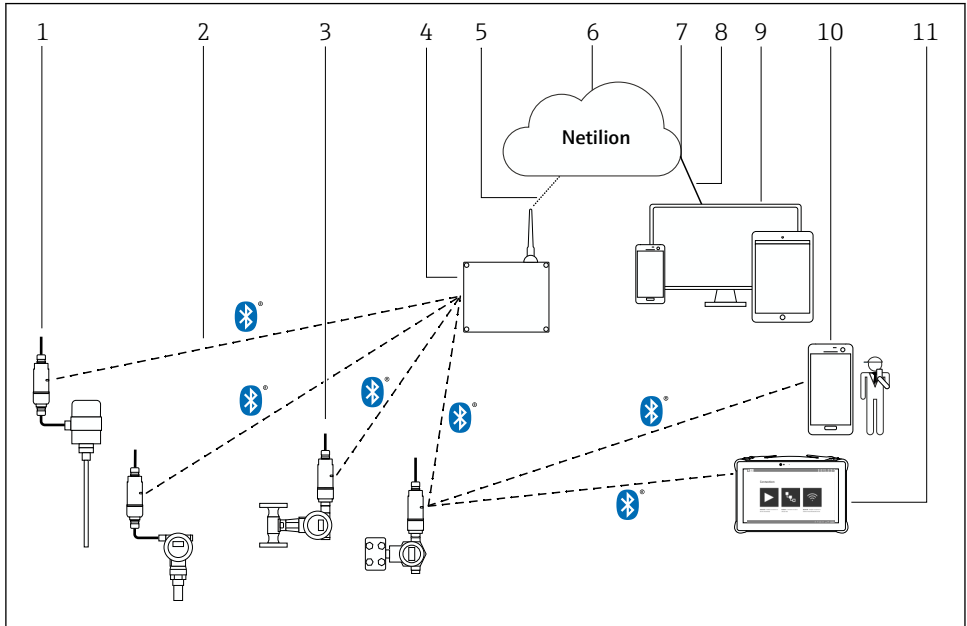
NOTICE

Safety applications with control functions via Bluetooth signal

Undesirable behavior of safety application

- Do not use a wireless signal such as Bluetooth in a safety application with a control function.

3.2 System architecture of the FieldPort SWA50 Bluetooth version



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1 System architecture of SWA50 Bluetooth version

- 1 HART field device with FieldPort SWA50, remote mounting
- 2 Encrypted wireless connection via Bluetooth®
- 3 HART field device with FieldPort SWA50, direct mounting
- 4 FieldEdge SGC200
- 5 LTE connection
- 6 Netilion Cloud
- 7 Application Programming Interface (API)
- 8 https Internet connection
- 9 Internet browser-based Netilion Service app or user application
- 10 Endress+Hauser SmartBlue app
- 11 Endress+Hauser Field Xpert, e.g. SMTxx

4 Incoming acceptance and product identification

4.1 Incoming acceptance

- Check the packaging for visible damage arising from transportation
- Open the packaging carefully
- Check the contents for visible damage
- Check that the delivery is complete and nothing is missing
- Retain all the accompanying documents



The device may not be put into operation if the contents are found to be damaged beforehand. In this case, please contact your Endress+Hauser Sales Center:

www.addresses.endress.com

Return the device to Endress+Hauser in the original packaging where possible.

4.2 Product identification

4.2.1 Nameplate

The nameplate of the device is lasered onto the housing.

4.2.2 Manufacturer's address

Endress+Hauser SE+Co. KG

Hauptstraße 1

79689 Maulburg

Germany

www.endress.com

4.3 Storage and transport

- The components are packed in such a way that they are fully protected against shock when in storage and during transportation.
- The permitted storage temperature is -40 to $+85$ °C (-40 to 185 °F).
- Store the components in the original packaging in a dry place.
- Where possible, only transport the components in the original packaging.

5 Mounting

5.1 Mounting instructions

- Pay attention to the alignment and range.
- Observe a distance of at least 6 cm from walls and pipes. Pay attention to the expansion of the Fresnel zone.
- Avoid mounting in close proximity to high-voltage devices.
- For a better connection, mount the FieldPort SWA50 in sight of a FieldEdge SGC200.
- Pay attention to the effect of vibrations at the mounting location.



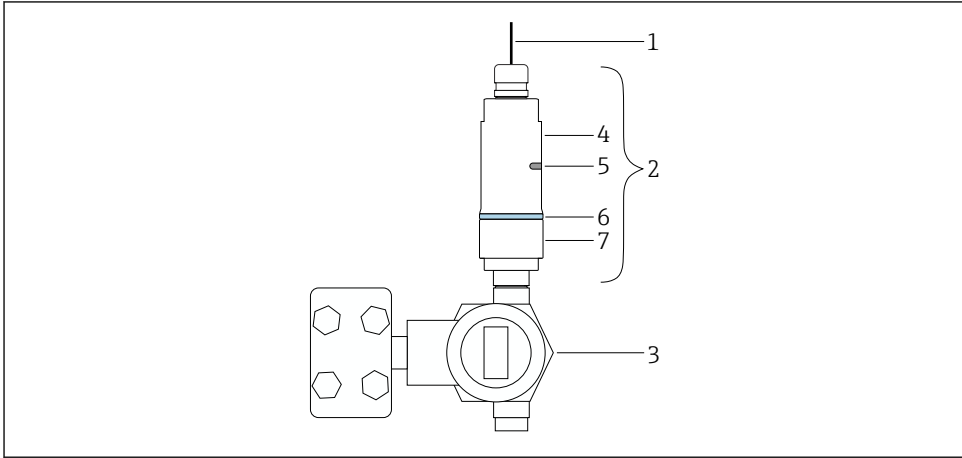
We recommend that you protect the FieldPort SWA50 against precipitation and direct sunlight. In order not to reduce signal quality, do not use a metal cover.



For detailed information on alignment, range and vibration resistance, see the Technical Information for the FieldPort SWA50 (TI01468S)

5.2 Mounting options



5.2.1 "Direct mounting" version



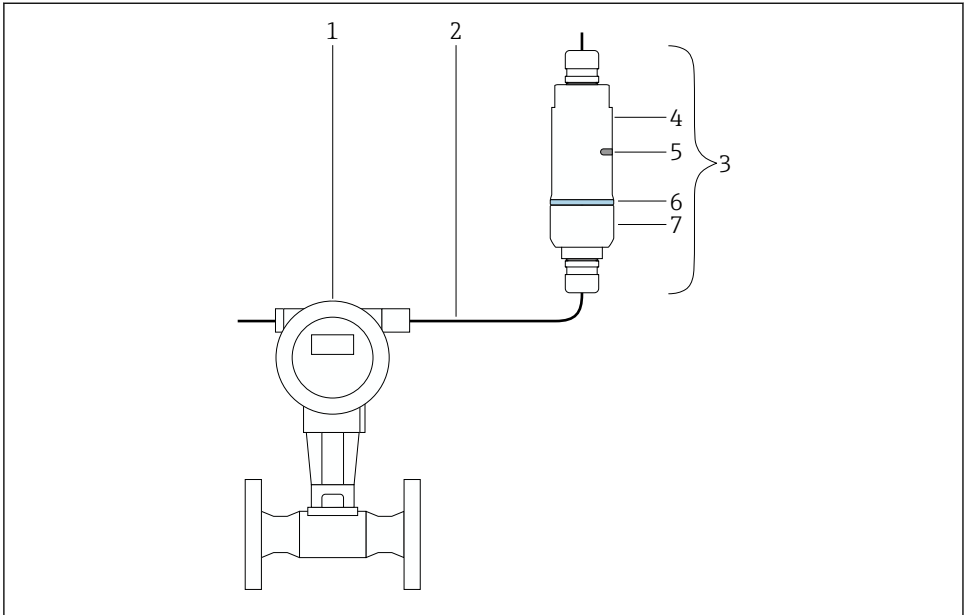
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2 Example of direct mounting

- 1 Cable
- 2 FieldPort SWA50 "direct mounting" version
- 3 HART field device
- 4 Bottom housing section
- 5 Transmission window
- 6 Design ring
- 7 Top housing section

 Montage sequence for the "direct mounting" version: →  11

5.2.2 "Remote mounting" version



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3 Example of remote mounting

- 1 HART field device
- 2 Cable
- 3 FieldPort SWA50 "remote mounting" version
- 4 Housing base
- 5 Transmission window
- 6 Design ring
- 7 Top housing section

 For remote mounting, we recommend the optional mounting bracket. Alternatively, you can secure the remote version using pipe clips.

 For detailed information on the mounting bracket, see the Technical Information for the FieldPort SWA50 (TI01468S)

Mounting sequence for "Remote mounting" version: Operating Instructions for FieldPort SWA50 Bluetooth (BA01987S)

5.3 Mounting the "direct mounting" version

NOTICE

Damaged seals.

IP degree of protection is no longer guaranteed.

- Do not damage seals.

NOTICE**Supply voltage is present during installation.**

Possible damage to the device.

- ▶ Switch off supply voltage prior to installation.
- ▶ Make sure the device is de-energized.
- ▶ Secure it against being switched back on.



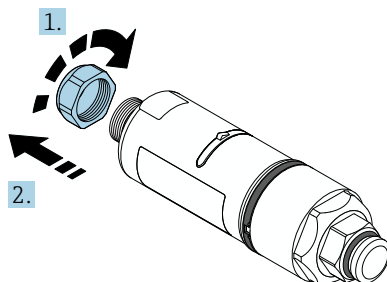
Electrical connection: → 19

Tools required

- Wrench AF24
- Wrench AF36

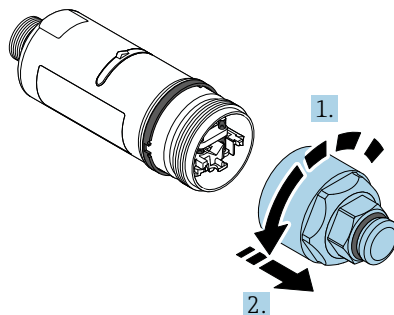
Mounting the FieldPort SWA50

1.



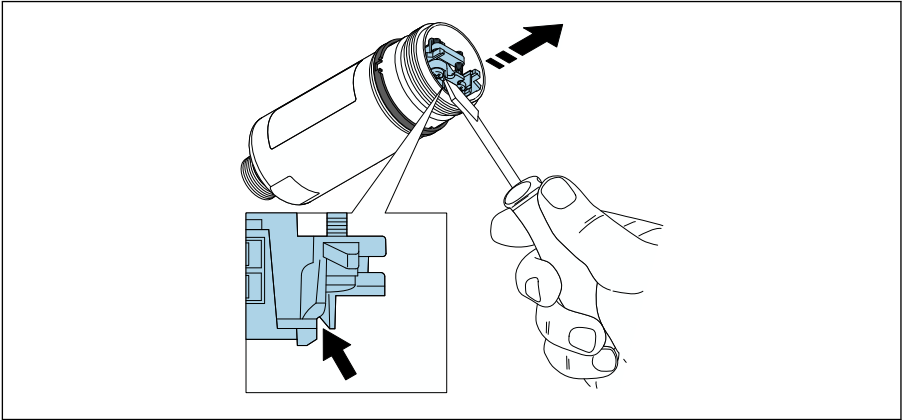
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2.



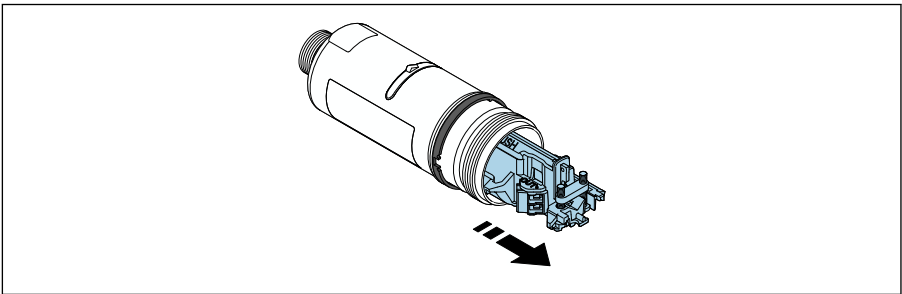
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3.



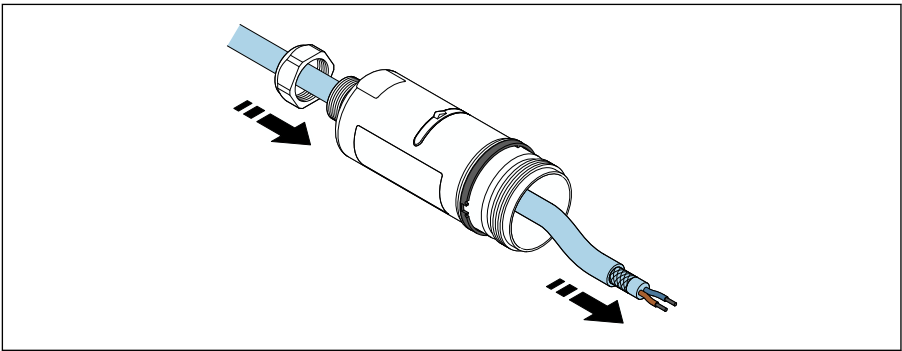
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4.

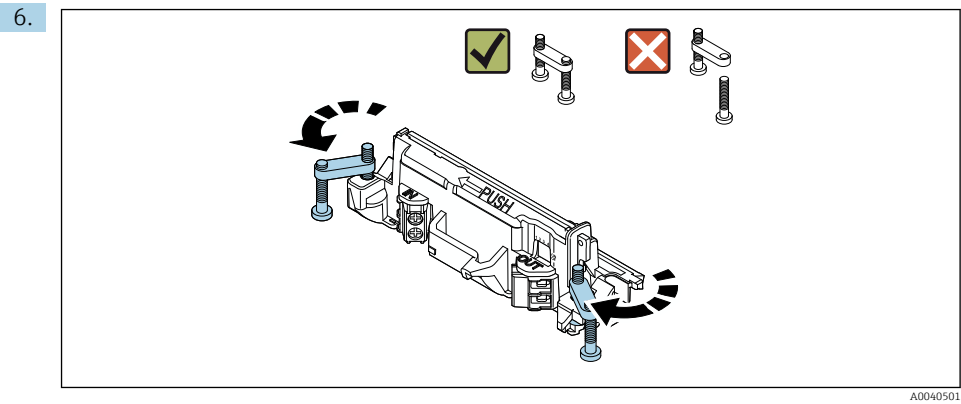


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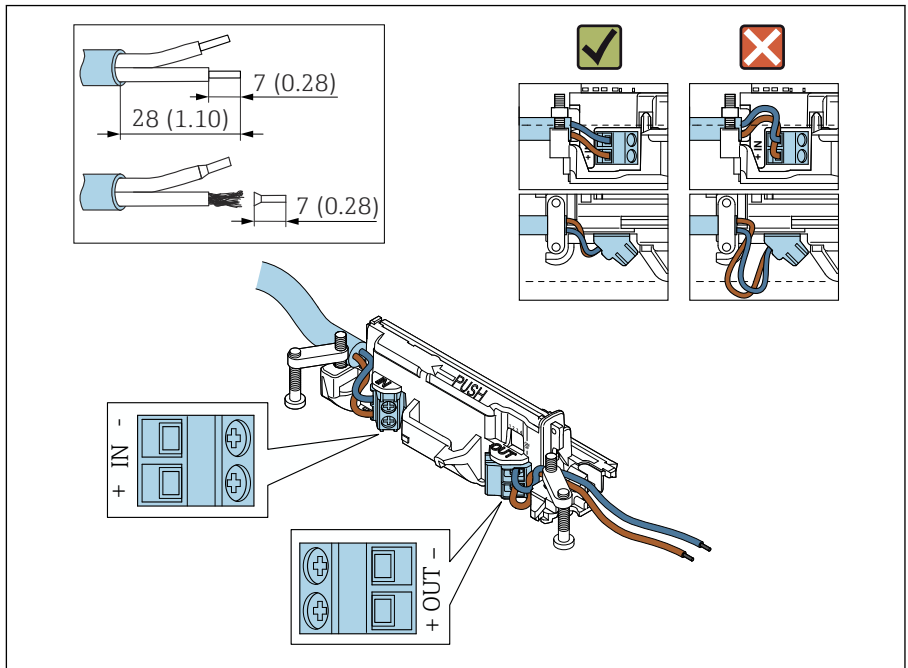
5.



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7.



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Ensure that the cores are of sufficient length to be connected in the field device. Do not shorten the cores to the required length until you are connecting them in the field device.

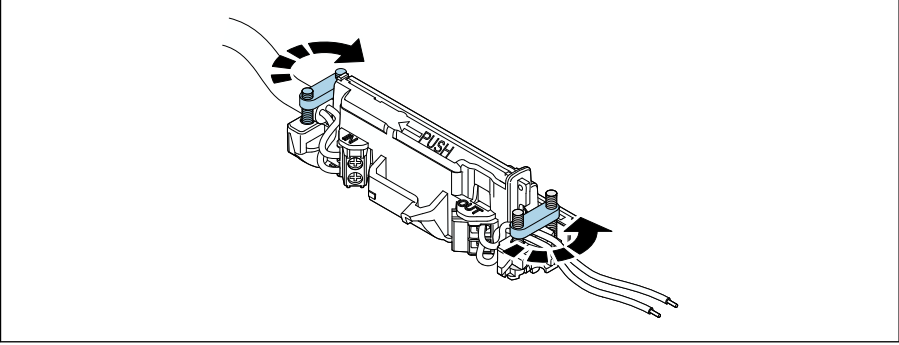


If you use a cable gland for a shielded cable, pay attention to the information on stripping the wire → 21.



- Electrical connection for 2-wire HART field devices with passive current output:
→ 22
- Electrical connection for 4-wire HART field devices with passive current output:
→ 22
- Electrical connection for 4-wire HART field devices with active current output:
→ 23
- Electrical connection for FieldPort SWA50 without HART field device: → 24

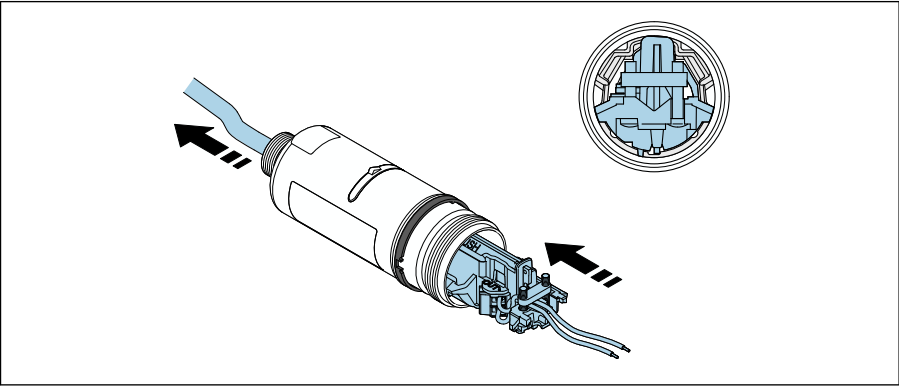
8.



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Tighten screws for strain relief. Torque: $0.4 \text{ Nm} \pm 0.04 \text{ Nm}$

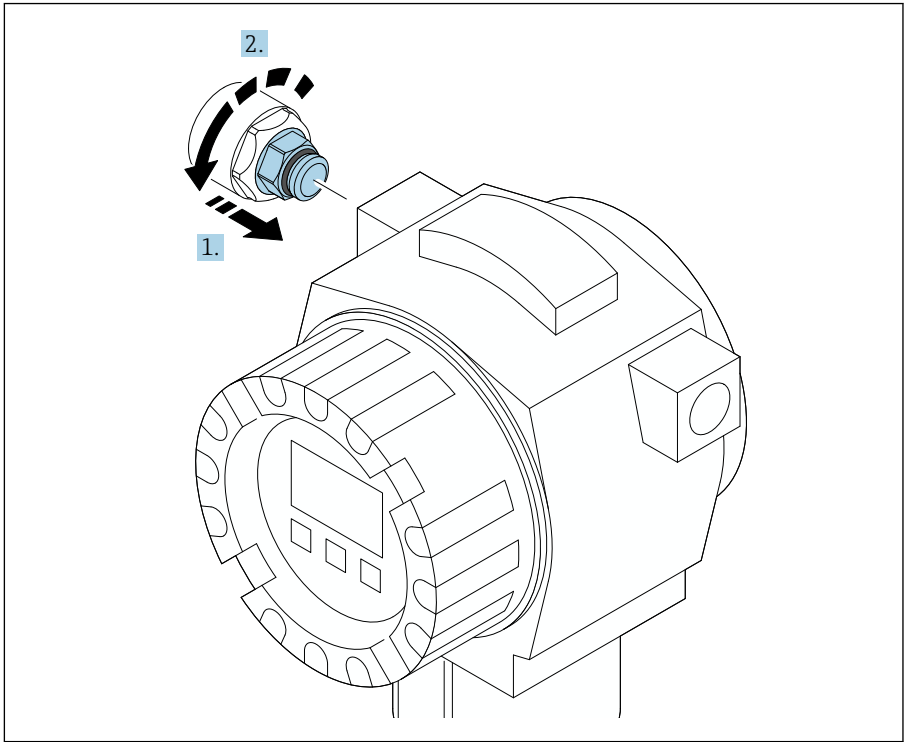
9.



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Slide the electronic insert into the guide inside the housing.

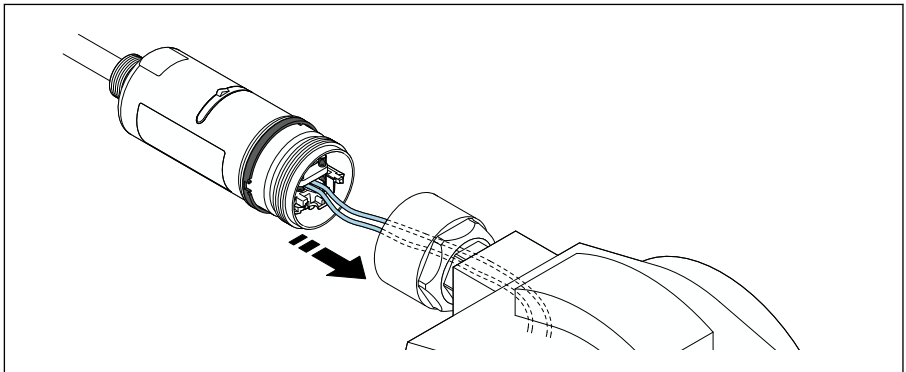
10.



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For information regarding torque, see the field device documentation.

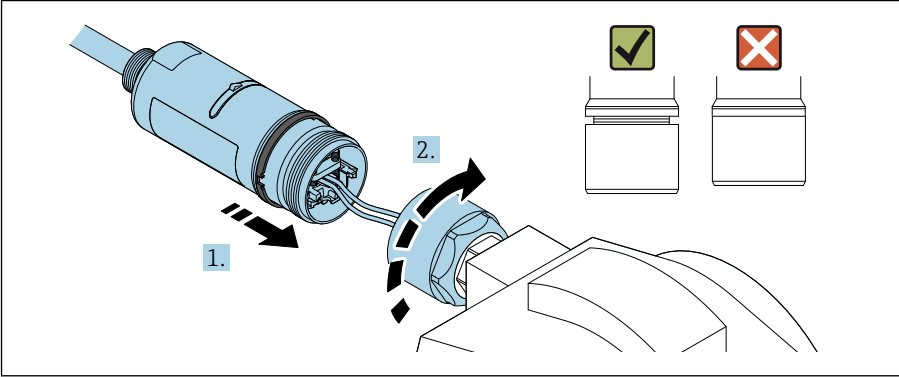
11.



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Ensure that the cores are of sufficient length to be connected in the field device. Shorten the cores in the field device to the required length.

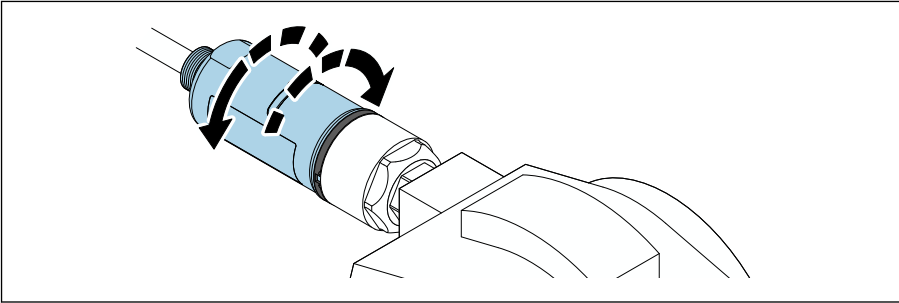
12.



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Do not tighten the top housing section yet, so that you are still able to rotate the bottom housing section.

13.

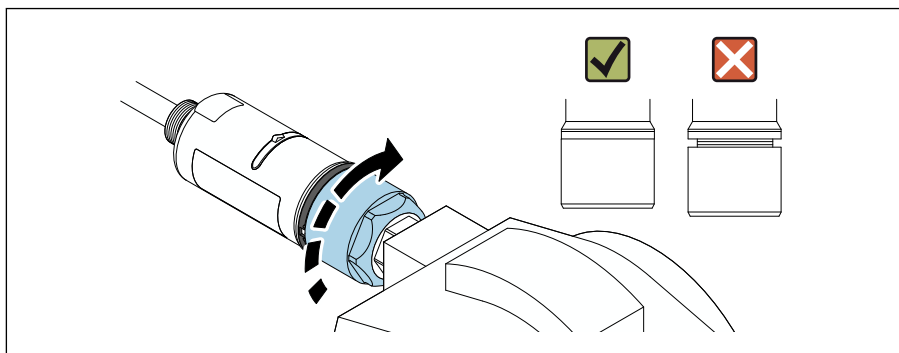


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Align the bottom housing section with the transmission window according to the network architecture .

i To avoid wire breaks, rotate the bottom housing section by a maximum of $\pm 180^\circ$.

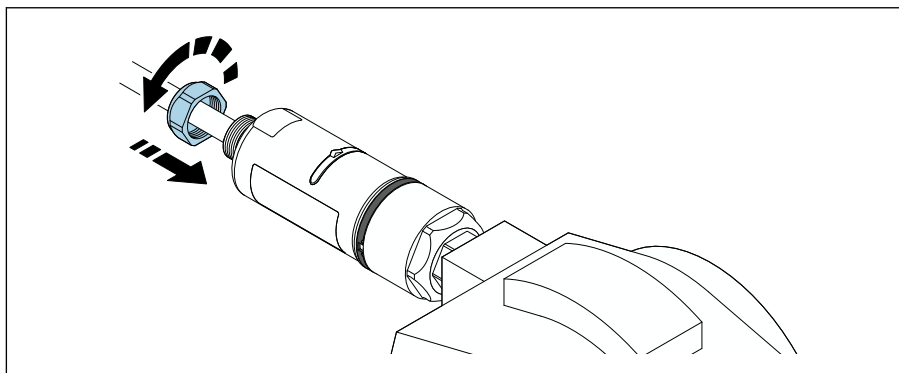
14.



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Tighten the top housing section so that the blue design ring can still be rotated afterwards. Torque: $5 \text{ Nm} \pm 0.05 \text{ Nm}$

15.



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16. Perform commissioning → 25.

6 Electrical connection

NOTICE

Short-circuit at OUT+ and OUT- terminals

Damage to device

- Depending on the application, connect either the field device, PLC, transmitter or resistor to the OUT+ and OUT- terminals.
- Never short-circuit the OUT+ and OUT- terminals.

6.1 Supply voltage

- Loop-powered 4 to 20 mA
- 24 V DC (min. 4 V DC, max. 30 V DC): min. 3.6 mA loop current required for start-up
- The supply voltage or the power unit must be tested to ensure it meets safety requirements and the requirements for SELV, PELV or Class 2

Voltage drop

- If internal HART communication resistor is deactivated
 - 3.2 V in operation
 - < 3.8 V at start-up
- If internal HART communication resistor is activated (270 Ohm)
 - < 4.2 V at 3.6 mA loop current
 - < 9.3 V at 22.5 mA loop current



To select the supply voltage, pay attention to the voltage drop via the FieldPort SWA50. The remaining voltage must be high enough to enable the start-up and operation of the HART field device.

6.2 Cable specification

Use cables that are suitable for the anticipated minimum and maximum temperatures.

Observe grounding concept of the plant.

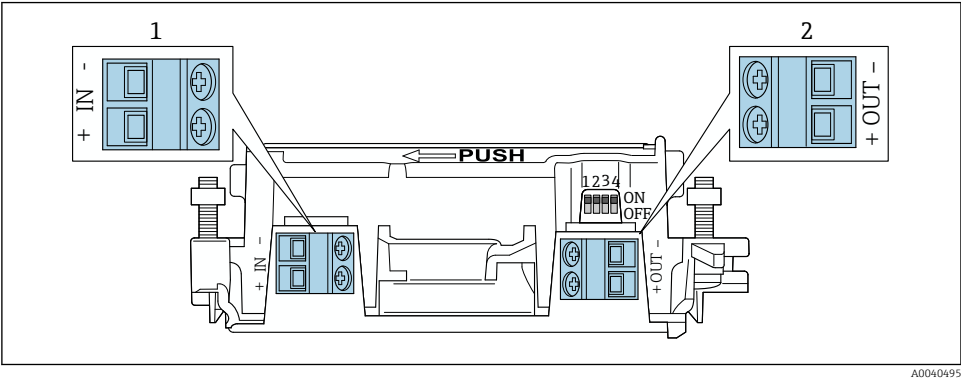
2 x 0.25 mm² to 2 x 1.5 mm²

You can use unshielded cable with or without ferrules and shielded cable with or without ferrules.



If you select the "direct mounting" version and the "4-wire HART field device with active current output and PLC or transmitter" electrical connection version, you can use core cross-sections of 0.75 mm² at maximum. If larger core cross-sections are required, we recommend remote mounting.

6.3 Terminal assignment



4 FieldPort SWA50 terminal assignment

- 1 Input terminal IN
- 2 Output terminal OUT

Application	Input terminal IN	Output terminal OUT
2-wire HART field device → 6, 22	Cable from supply voltage, PLC with active current output or transmitter with active current output	Cable to 2-wire HART field device
4-wire HART field device with passive current output → 7, 23	Cable from supply voltage, PLC with active current output or transmitter with active current output	Cable to 4-wire HART field device
4-wire HART field device with active current output → 23	Cable from 4-wire field device with active 4 to 20 mA HART output	PLC or transmitter with passive current output (optional), alternatively wire bridge between terminals OUT+ and OUT-
FieldPort SWA50 without field device → 10, 24	Cable from supply voltage for FieldPort SWA50	Resistor between terminals OUT+ and OUT-

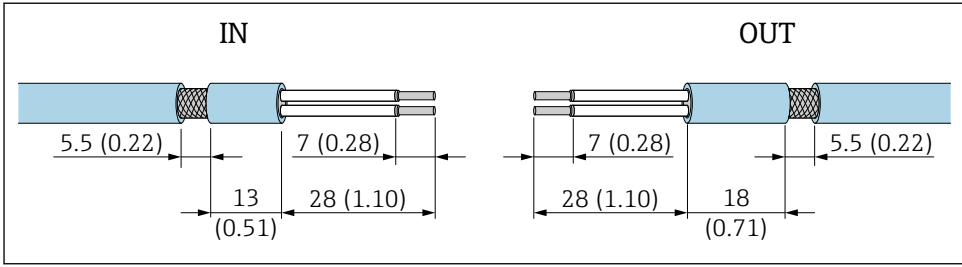
6.4 Stripping in the case of a cable gland for shielded cable

If you are using shielded cables and wish to connect the cable shield to the FieldPort SWA50, you must use cable glands for shielded cable.

If you have ordered the "Brass M20 for shielded cable" option for the cable glands, you will receive the following cable glands:

- "Direct mounting" version: 1 cable gland for shielded cable
- "Remote mounting" version: 2 cable glands for shielded cable

When mounting a cable gland for shielded cable, we recommend the following dimensions for stripping. The dimensions for input terminal IN and output terminal OUT are different.



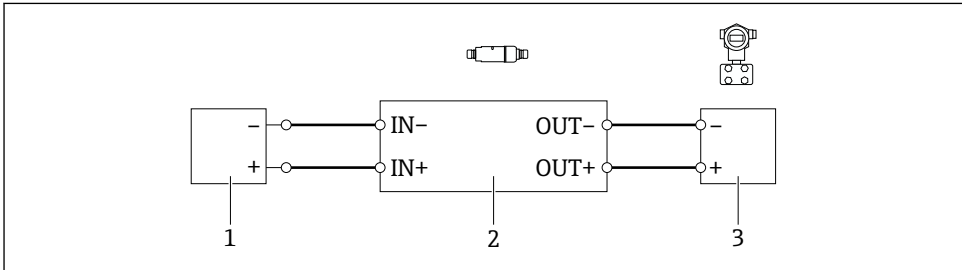
A0043665

- 5 Recommended dimensions for stripping in the case of cable glands for shielded cable for input terminal IN and output terminal OUT

- Sealing area (jacket): \varnothing 4 to 6.5 mm (0.16 to 0.25 in)
- Shielding: \varnothing 2.5 to 6 mm (0.1 to 0.23 in)

6.5 2-wire HART field device with passive current output

- Some grounding concepts require shielded cables. If connecting the cable shield to the FieldPort SWA50, you must use a cable gland for shielded cable. See ordering information.



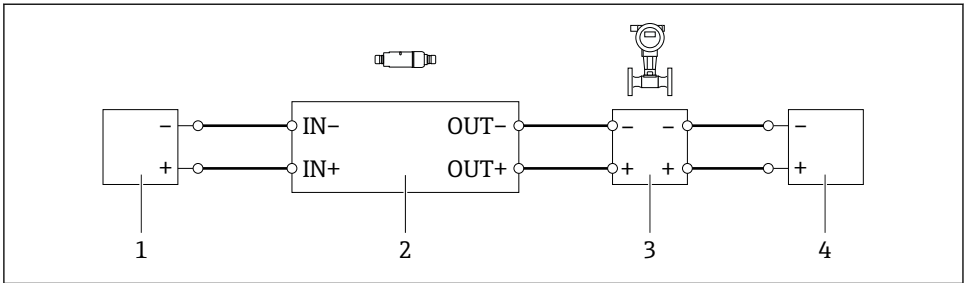
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- 6 Electrical connection for 2-wire HART field devices with passive current output (optional grounding not shown)

- Supply voltage (SELV, PELV or Class 2) or PLC with active current input or transmitter with active current input
- Electronic insert SWA50
- 2-wire field device 4 to 20 mA-HART

6.6 4-wire HART field device with passive current output

- Some grounding concepts require shielded cables. If connecting the cable shield to the FieldPort SWA50, you must use a cable gland for shielded cable. See ordering information.



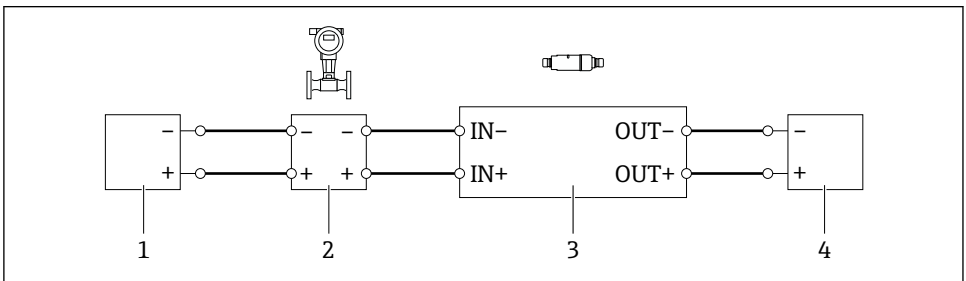
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7 Electrical connection for 4-wire HART field devices with passive current output (optional grounding not shown)

- 1 Supply voltage (SELV, PELV or Class 2) or PLC with active current input or transmitter with active current input
- 2 Electronic insert SWA50
- 3 4-wire field device with passive 4 to 20 mA-HART output
- 4 Supply voltage for 4-wire field device

6.7 4-wire HART field device with active current output

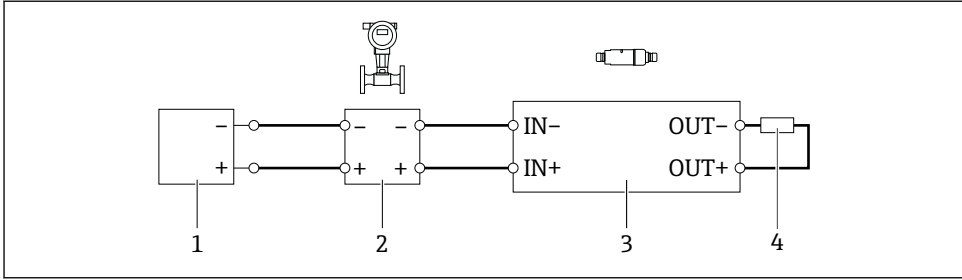
i Some grounding concepts require shielded cables. If connecting the cable shield to the FieldPort SWA50, you must use a cable gland for shielded cable. See ordering information.



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8 Electrical connection for 4-wire HART field devices with active current output (optional grounding not shown) – PLC or transmitter at OUT terminals

- 1 Supply voltage (SELV, PELV or Class 2) for 4-wire HART field device
- 2 4-wire field device with active 4 to 20 mA HART output
- 3 Electronic insert SWA50
- 4 PLC or transmitter with passive current input



A0045101

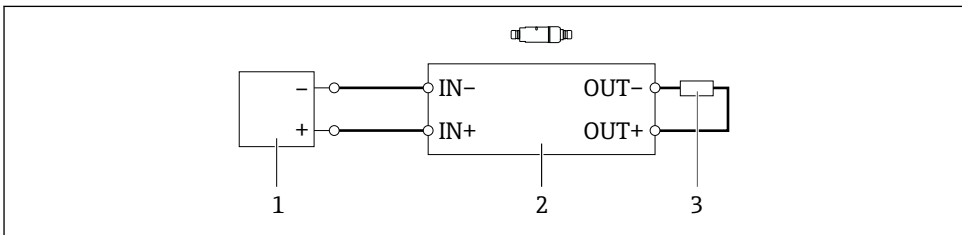
9 Electrical connection for 4-wire HART field devices with active current output (optional grounding not shown) – resistor at OUT terminals

- 1 Supply voltage (SELV, PELV or Class 2) for 4-wire HART field device
- 2 4-wire field device with active 4 to 20 mA HART output
- 3 Electronic insert SWA50
- 4 Resistance 250 to 500 Ohm min. 250 mW between terminals OUT+ and OUT–

i If you select the "direct mounting" version and the "4-wire HART field device with active current output and PLC or transmitter" electrical connection version, you can use core cross-sections of 0.75 mm² maximum. The wires that you insert into the shorter top housing section must be connected to the IN terminals opposite, and the wires that you insert into the longer bottom housing section must be connected to the OUT terminals opposite. If larger core cross-sections are required, we recommend remote mounting.

6.8 FieldPort SWA50 without HART field device (repeater)

i Using this connection version, you can preconfigure the FieldPort SWA50 or use it as a repeater.



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10 FieldPort SWA50 without HART field device (optional grounding not shown)

- 1 Supply voltage FieldPort SWA50, 20 to 30 VDC (SELV, PELV or Class 2)
- 2 Electronic insert SWA50
- 3 Resistance 1.5 kOhm and min. 0.5 W between terminals OUT+ and OUT–

7 Commissioning

7.1 Overview of operation options


You have the following options for commissioning the FieldPort SWA50:

- The Endress+Hauser SmartBlue app for mobile devices →  26
- An Endress+Hauser Field Xpert SMTxx tablet PC
- The Endress+Hauser FieldCare SFE500 field device configuration tool




For information on commissioning with Field Xpert or FieldCare: Operating Instructions for FieldPort SWA50 Bluetooth (BA01987S)



Observe the requirements for commissioning: →  25

7.2 Requirements

7.2.1 Requirements of the FieldPort SWA50

- The FieldPort SWA50 is electrically connected.
- DIP switch 1 for Bluetooth communication must be set to ON →  29.
(Factory setting for DIP switch 1: ON)

7.2.2 Information required for commissioning

You will need the following information for commissioning:

- HART device address of HART field device
- Device tag of HART field device in Bluetooth network
 - Long tag for HART-6 and HART-7 field devices
 - (Short) tag for HART-5 field devices

7.2.3 Points to check before commissioning

HART master

In addition to the FieldPort SWA50, only one other HART master is permitted in the HART loop. This other HART master and the FieldPort SWA50 may not be of the same master type. You can configure the master type either via the "HART master type" parameter or "Master Type".

HART communication resistor

For HART communication, you require either the internal HART communication resistor of the FieldPort SWA50 or a HART communication resistor outside the FieldPort SWA50 in the 4 to 20 mA loop.

Requirements for "internal HART communication resistor":

The "Internal" option is set for the "Communication resistor" parameter.

Requirements for "HART communication resistor outside the FieldPort SWA50":

- The HART communication resistor of ≥ 250 Ohm is outside the FieldPort SWA50 in the 4 to 20 mA loop.
- The HART communication resistor must be wired in series between the "IN+" terminal of the FieldPort SWA50 and the supply voltage, such as the PLC or active barrier.
- The "External" option is set for the "Communication resistor" parameter.

7.2.4 Initial password

The initial password can be found on the nameplate.

7.3 Putting the FieldPort SWA50 into operation

7.3.1 Commissioning via SmartBlue app

Install the SmartBlue app

The SmartBlue app is available for download from the Google Play Store for mobile devices with Android and from the Apple App Store for devices with iOS.



Scan the QR code.

- ↳ The Google Play or App Store page is opened to download the SmartBlue app.

System requirements



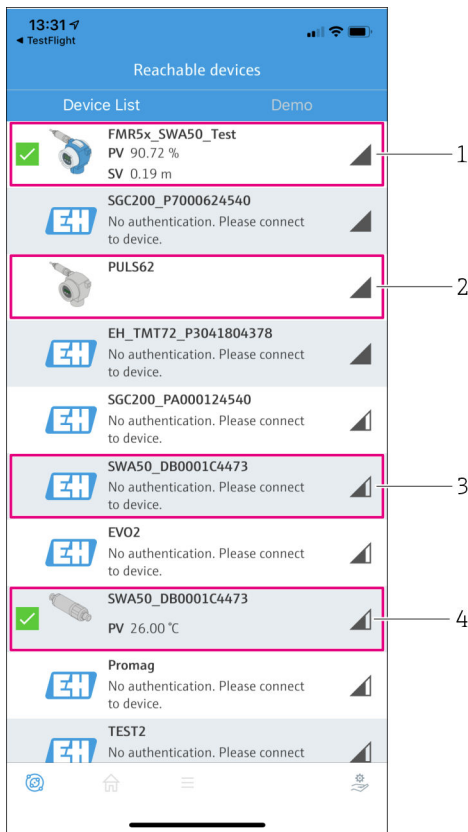
Please see either the Google Play or App Store page for the system requirements of the SmartBlue app.


Starting the SmartBlue app and logging in

1. Switch on the supply voltage for the FieldPort SWA50.

2. Start the SmartBlue app on the smartphone or tablet.

- An overview of accessible devices is displayed.

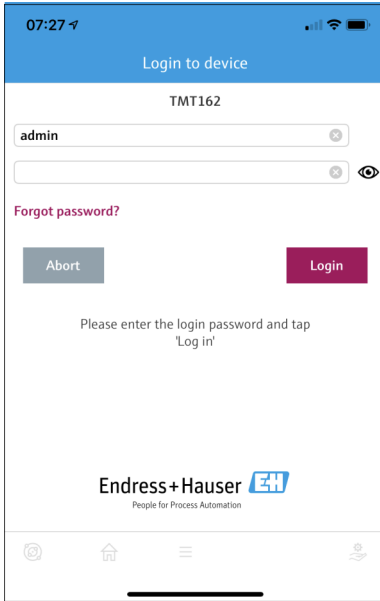


 11 Reachable devices (live list)

- 1 Example of FieldPort SWA50 with Endress+Hauser HART field device, already connected to SmartBlue app
- 2 Example of FieldPort SWA50 with HART field device of another manufacturer, already connected to SmartBlue app
- 3 Example of FieldPort SWA50, not yet connected to SmartBlue app
- 4 Example of FieldPort SWA50 without HART field device, already connected to SmartBlue app

3. Select device from list.

- ↳ The "Login to device" page is displayed.



 12 Login


 You can establish only **one** point-to-point connection between **one** FieldPort SWA50 and **one** smartphone or tablet.

- Log in. Enter **admin** as the user name and enter the initial password. The password can be found on the nameplate.
 - ↳ Once the connection has been established successfully, the "Device information" page is displayed for the selected device.

 Change the password after logging in for the first time.

Checking and adjusting the HART configuration

Perform the following steps to ensure good communication between the FieldPort SWA50 and the connected HART field device.

-  The parameters listed in this section can be found on the "HART Configuration" page.
- Navigation: Root menu > System > FieldPort SWA50 > Connectivity > HART configuration

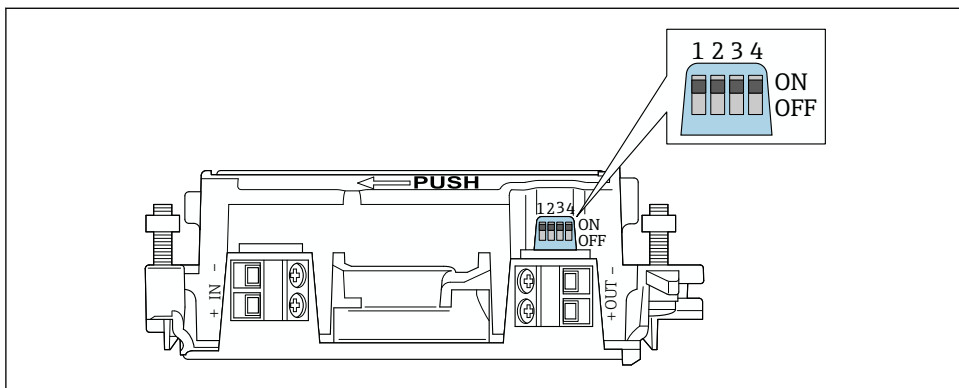
1. Use the "HART address field device" parameter to check the HART address of the HART field device and configure the address if necessary. The same HART address must be used for the HART field device in the HART field device and in the FieldPort SWA50.

2. Use the "Communication resistor" parameter to check the setting for the HART communication resistor. If there is no HART communication resistor outside the FieldPort SWA50 in the 4 to 20 mA loop, you must enable the internal HART communication resistor.
3. Use the "HART master type" parameter to check the setting for an additional HART master in the HART loop. In addition to the FieldPort SWA50, only one other HART master is permitted in the HART loop. This other HART master and the FieldPort SWA50 may not be of the same master type.

8 Operation

8.1 Hardware locking

The DIP switches for hardware-locking are located on the electronic insert.



A004.17/84

 13 DIP switches for hardware-locking of functions

DIP switch	Function	Description	Factory setting
1	Bluetooth communication	<ul style="list-style-type: none"> ■ ON: Communication via Bluetooth is possible, e.g. via SmartBlue App, Field Xpert and FieldEdge SGC200. ■ OFF: Communication via Bluetooth is not possible. 	ON
2	Firmware update	<ul style="list-style-type: none"> ■ ON: You can carry out firmware updates. ■ OFF: You cannot carry out firmware updates. 	ON

DIP switch	Function	Description	Factory setting
3	Configuration via Bluetooth	<ul style="list-style-type: none">▪ ON: Configuration via Bluetooth is possible, e.g. via SmartBlue App and Field Xpert.▪ OFF: Configuration via Bluetooth is not possible. A connection set up via the FieldEdge SGC200 between the FieldPort SWA50 and the Netilion Cloud remains active.	ON
4	Reserve	–	–


8.2 LEDs

2 LEDs

- Green: Flashes four times at start-up to indicate that the device is operational
- Orange: Flashes every 2 seconds to indicate that a squawk function has been enabled
Activate the squawk function in the SmartBlue app using the "Identification" parameter

The LEDs are located on the electronic insert and are not visible from the outside.

9 Technical data

 For detailed information on "technical data": see Technical Information TI01468S



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