SITRANS AW200 WirelessHART adapter

Overview

SITRANS AW200 WirelessHART Adapter

The WirelessHART adapter SITRANS AW200 is a battery-powered communication component that integrates the HART and 4 to 20 mA field devices into a WirelessHART network. On the wireless communication side, the adapter supports the WirelessHART standard. HART and 4 to 20 mA field devices are connected on the field device side.

The WirelessHART adapter SITRANS AW200:

- Supports the WirelessHART standard (HART V 7.1)
- Features an extremely high degree of security for wireless data transmission.
- Integrates a 4 to 20 mA field device or up to four HART field devices (in multidrop mode) into a WirelessHART network.
- Features an intelligent energy management system for supplying connected field devices.
- Easy to configure with SIMATIC PDM.

Benefits

- High quality and service life
- Save on wiring costs in difficult installation conditions (e.g. for moveable components) and for temporary installations.
- Subsequent integration of an installed field device with a HART interface into maintenance and diagnostic systems if the control system does not feature the required communication mechanisms.
- Proven HART devices can continue to be used for wireless communication without any limitations.
- Field devices with 4 to 20 mA interface (without HART) can be connected.
- Intelligent energy management to achieve the best possible service life for the installed battery unit
- Optimum addition to wired communication and expansion of solution options for system solutions in process automation
- Burst mode and event notification configuration for the adapter and connected field devices.

Application

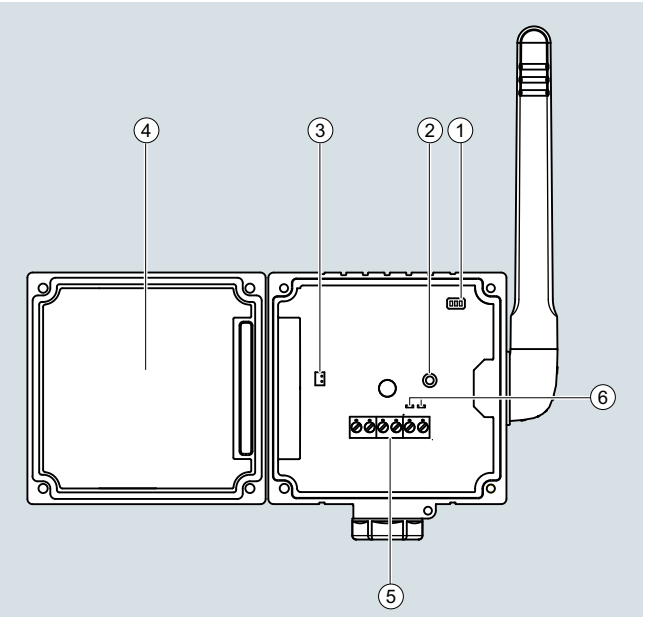
The WirelessHART adapter can be used in a number of different applications:

- Access to installed basis
  Diagnostic information is obtained from existing wired HART devices thanks to the permanent electrical connection of a WirelessHART adapter, and is sent to system-based asset management software.
- Status monitoring of system
  Wireless devices are mounted at critical points in the system, which are not usually connected to the control room due to difficult accessibility or extensive costs for wiring. Better data flow and diagnostics increase plant reliability, transparency and safety.
- Process optimization
  Temporary installation of a 4 to 20mA or standard HART device together with a SITRANS AW200 WirelessHART adapter allows easier monitoring and plant optimization at lower costs.
- Process monitoring
  Measured values, for example from tanks or silos, are transmitted to a higher-level system at regular intervals, together with the device and battery status.

Design

The SITRANS AW200 WirelessHART Adapter consists of:

- An enclosure with a fitted aerial
- Electronics
- A high-performance lithium battery unit



1 LED
2 Push button
3 Plug to connect battery
4 Battery compartment
5 Terminals 1 to 6
6 Terminal tag for HART modem

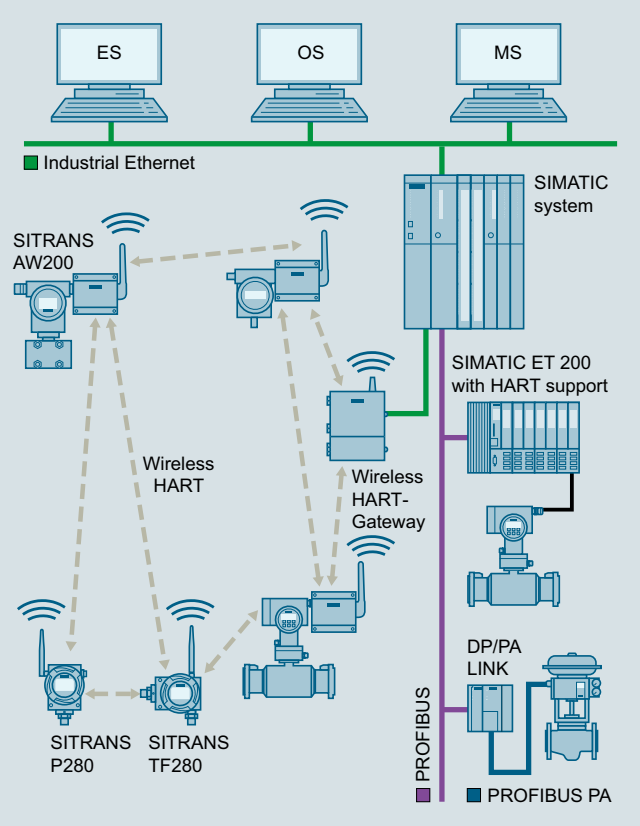
SITRANS AW200 Wireless-HART Adapter, assembly

The enclosure can be opened by loosening 4 screws. This enables you to access the electronics and battery unit. The battery unit is removed without the use of tools, since it is connected to the housing with clips.

On the back of the enclosure is the connector with a fixing nut onto which various different replaceable connecting pieces can be screwed to mount the adapter straight onto a field device.

On the base of the enclosure is an optional cable inlet which can be used for a cable gland. Up to 2 cables can be inserted for offset adapter installation.

Function



SITRANS AW200 WirelessHART Adapter. functional diagram

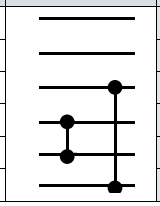
Measured values and diagnostic information of connected field devices with HART communication are transmitted via a wired connection to the WirelessHART adapter. The adapter transmits this information as wireless signals to a WirelessHART gateway. From here, the information is available to the network of the system.

If a field device with a 4 to 20 mA output signal is connected to the adapter, only the measured value will be transmitted.

Following configuration and integration into a WirelessHART network, each WirelessHART adapter is able to recognize its neighbors. It notes the strength of the wireless signal, synchronizes itself, receives network information and then establishes connections to its neighbors in the wireless network. A WirelessHART network organizes itself. Manual settings for organization are not required.

Two and four-wire field devices can be connected to a WirelessHART adapter. In the case of a connected two-wire field device, voltage can be supplied by the adapter. Where multiple two-wire field devices are connected (multi drop operation), the adapter must be connected to an external power supply.

The WirelessHART adapter may also be connected in parallel to an already existing installation which consists of a power supply and a HART field device.

Connection	Wiring	Function
1		Power supply for the field device
2		HART/4 ... 20 mA
3		External supply/Dimensions
4		High-resistance HART connection
5, 7		High-resistance HART connection
6, 8		Mass, high-resistance connection

Terminal block with 6 screw connection clamps

Parameter assignment

SITRANS AW200 configured via HART. Configuration can be carried out using a handheld communicator or, more conveniently, with a HART modem and the SIMATIC PDM configuration software.

Initial startup of the adapter is usually carried out via SIMATIC PDM and a HART modem or a handheld communicator. During initial startup, the network ID and join key are set in the adapter. These parameters are used to integrate the adapter into an existing WirelessHART network.

Following integration into the network, the adapter and HART devices connected can be conveniently operated via the WirelessHART network or with the local HART modem.

Siemens HART field devices for the adapter

HART and 4…20mA field devices can be connected to the SITRANS AW200 WirelessHART adapter. Depending on the electrical data of the field devices, they can receive their power supply from the WirelessHART adapter or will require an external power supply. See https://support.industry.siemens.com/cs/ww/en/ for FAQ with the latest information on connectivity for Siemens field devices.

Note

Siemens has only approved the Siemens HART field devices listed there for the adapter, and will only provide technical support for these devices.

Based on HART specifications, it is generally possible to connect devices that are not listed, however with the following restrictions:

- All warranties and liability will be excluded
- No technical support

Technical specifications

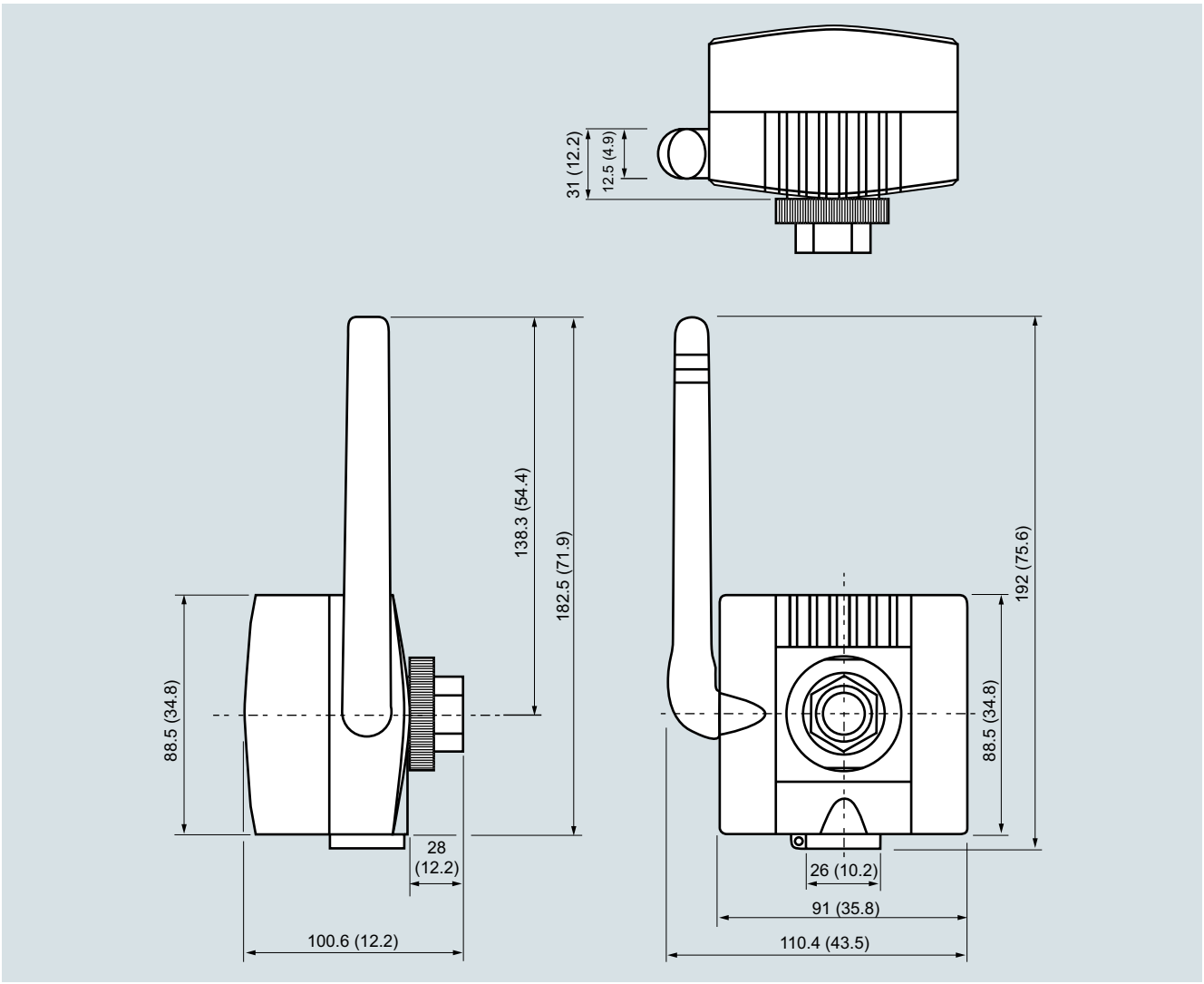
Input	
Input	Point-to-Point connection to a HART field device or Point-to-Point connection to a 4 ... 20 mA field device or up to four HART field devices with external power supply which are integrated using the multidrop method
Communication	HART communication using multidrop method, 4 ... 20 mA power signal with Point-to-Point connection
Protocol	HART V7 (compatible with previous HART versions)
Transfer rate	1200 bits/s using HART multidrop method
Output	
Communication	WirelessHART V7
Transfer rate	Nominal 250 kBits/s
Transmission frequency band	2.4 GHZ (ISM band)
Range (under reference conditions)	Outside areas up to 250 m, within buildings up to 50 m
RF signal strength	Can be configured: 0 dBm and 10 dBm
Output signals	
• WirelessHART adapter	Measured voltage and up to 3 other variables may be selected from the following: adapter temperature, battery voltage, energy consumed, expected battery service life
• 4 ... 20 mA field device	Scaled or linearized process values
• HART field device	Up to 4 process variables, can be configured via PDM or gateway
Measuring accuracy (as per reference conditions IEC 61298-2)	
Max. measuring error (4 ... 20 mA circuit)	0.125 % re: measuring range
Effect of ambient temperature (4 ... 20 mA circuit)	5 µA/0°K
Rated conditions	
Location	Outside/inside
Ambient conditions	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F) The capacity of the battery decreases rapidly if the ambient temperature falls below -30 °C.
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F) without batteries < 21 °C with batteries
• Relative humidity	Max 90 % at 25 °C (non-condensating)
• Resistance to vibration	20 ≤ f ≤ 2000 Hz: 0.01 g^2/Hz as per IEC 68-2-64
• Shock resistance	15 g, 11 ms as per IEC 68-2-27
Electromagnetic compatibility	Acc. to EN 61326, EN 301 489-1/17 and NAMUR NE 21

Design	
Weight	• 0.5 kg without battery • 0.75 kg with battery
Enclosure	
• Material	• Polyester (PBT FR) • Aluminum
• Cable entry	2x M20x1.5
Degree of protection	IP65, IP66; NEMA 4
Aerial	Omnidirectional dipolar aerial, vertical rotation
Mounting adapter	M20x1.5 to M20x1.5, M20x1.5 to G½, M20x1.5 to ½ - 14 NPT, M20x1.5 to ¾ - 14 NPT
Auxiliary power	
Battery	Lithium thionylchlorid high-performance battery unit
Supply voltage	5 V DC ... 7.2 V DC
Capacity	19 AH at 20 °C
Service life	5 ... 7 years, depending on update rate, connected field device and ambient conditions
Field device voltage supply (not in multidrop mode)	
• No-load voltage	8 ... 23 V DC
• Current	4 … 20mA (in accordance with NAMUR Recommendation NE 43)
• Fault current (not with multidrop)	I ≤ 3.6 mA or I ≥ 21 mA
• Protection	Short-circuit proof, activated at voltages > 25 mA
Voltage supply for one or more field devices (in multidrop mode)	
• Voltage	< 30 V direct current
• Current	< 25 mA
Certificates and approvals	
Wireless communication approvals	ETSI (R&TTE) FCC Part 15.247 for wireless applications in the 2.4 GHz transmission frequency band EN 300 328
ATEX approvals	ATEX II 2G Ex ia IIC T4/T3 Gb ATEX II 2G Ex ia IIC T4/T3 Gb, ATEX II 2D Ex tb [ia] IIIC IP6x T 70°C Db
CSA approvals	Class I, DIV 1, GRP ABCD Class I, DIV 2, GRP ABCD Class I, Zone 1, Ex ia IIC, AEx ia IIC T4/T3C Class II, DIV 1, GRP EFG Class II, DIV 2, GRP FG Class III
IECEx approvals	IECEx Ex ia IIC T4/T3 Gb IECEx Ex ia IIC T4/T3 Gb, IECEx Ex tb [ia] IIIC T 70°C Db

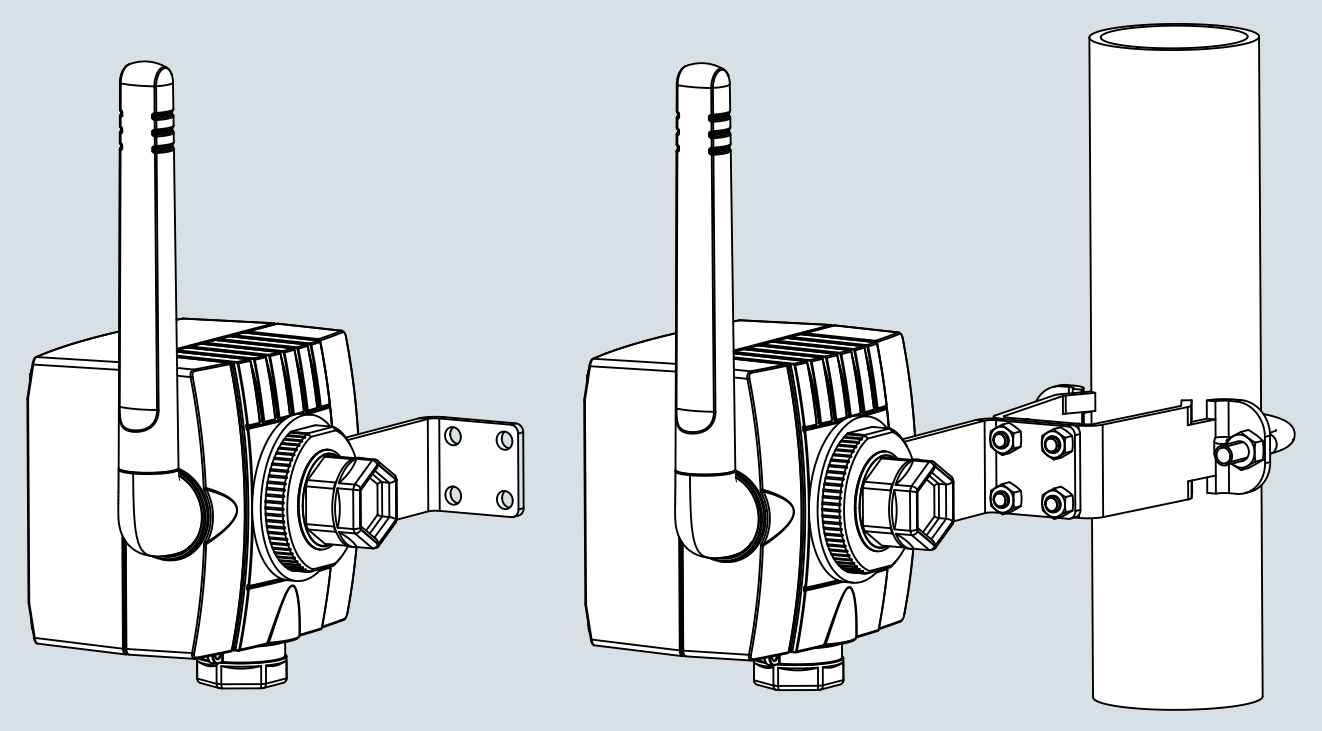
Selection and ordering data

	Article No.
SITRANS AW200 Wireless HART Adapter ↗	**7MP3112-** ■■■■ **0 - 0 A A 0 0**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Device type	
4 ... 20 mA and/or Wireless Hart Interface	**1**
Power supply	
Battery powered	**A**
Approvals and certificates	
Without explosion protection	**A**
ATEX II 2G Ex ia IIC T4/T3 Gb	**B 0**
ATEX II 2G Ex ia IIC T4/T3 Gb, ATEX II 2D Ex tb [ia] IIIC IP6x T 70°C Db	**C 1**
CSA Universal application	**D**
Class I, DIV 1, DIV 2, GRP ABCD, Class I, Zone 1, Ex ia IIC, AEx ia IIC T4/T3C, Class II, DIV 1, GRP EFG, DIV 2, GRP FG, Class III	**E**
IECEx Ex ia IIC T4/T3 Gb	**F 0**
IECEx Ex ia IIC T4/T3 Gb, IECEx Ex tb [ia] IIIC T 70°C Db	**G 1**
Enclosure	
Polyester, IP66, NEMA Type 4	**0**
Aluminum, IP66/67 NEMA Type 4X	**1**
Accessories	
Lithium battery for SITRANS AW200	**7MP3990-0AA00**
Threaded adapter for direct mounting of the adapter to a field device	
• Threaded adapter M20	**7MP3990-0BA00**
• Threaded adapter G½	**7MP3990-0BB00**
• Threaded adapter G½ - 14 NPT	**7MP3990-0BC00**
• Threaded adapter G¾ - 14 NPT	
Mounting bracket for mounting to wall/pipe, material: Stainless steel SS304, including cable gland	**7MP3990-0BD00**

Dimensional drawings

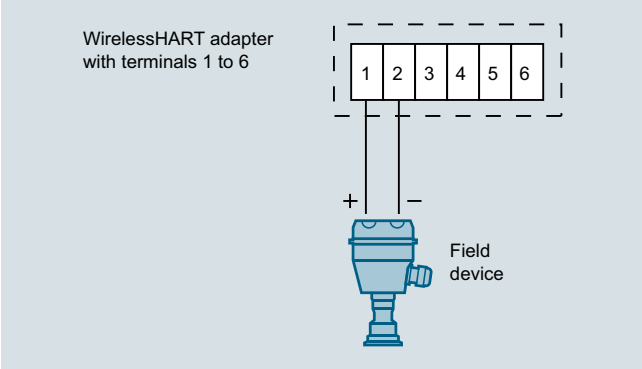


SITRANS AW200 WirelessHART Adapter, dimensions in mm (inch)

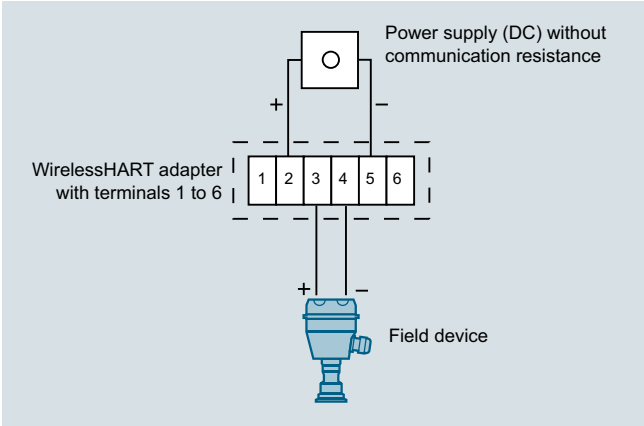


SITRANS AW200 with built-in mounting bracket for wall or pipe mounting

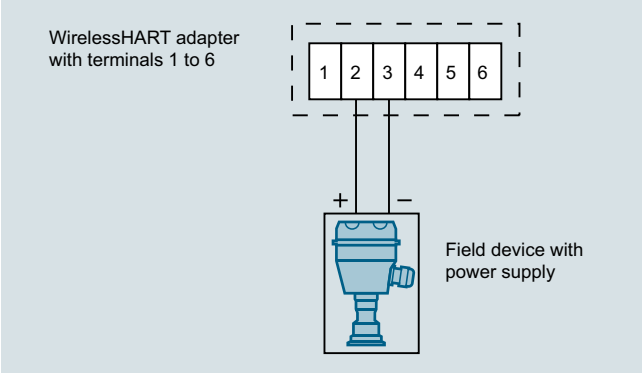
Circuit diagrams



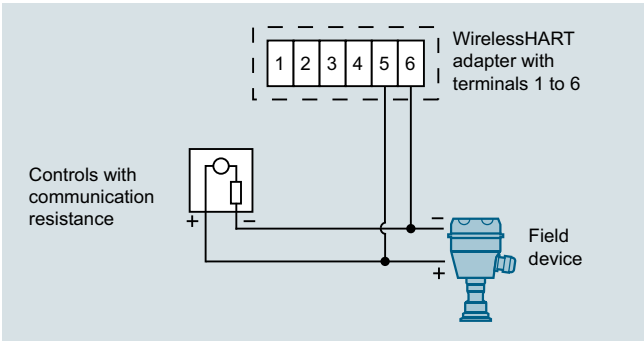
Connection of two-wire field device, power supply provided by adapter



Connection of two-wire field device with external power supply



Connection of four-wire field device



Connecting the adapter in parallel with wired 4 to 20 mA communication.