SITRANS AW200 - WirelessHART adapter

Overview

SITRANS AW200 WirelessHART adapter

The SITRANS AW200 WirelessHART adapter is a battery-powered communication component, which integrates 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 SITRANS AW200 WirelessHART adapter

- Support the WirelessHART standard (HART V 7.1)
- Features a very high degree of security for wireless data transmission
- Integrates one 4 to 20 mA field device or up to four HART field devices (in multidrop mode) into a WirelessHART network
- Features intelligent energy management for the power supply of connected field devices
- Can be easily parameterized using SIMATIC PDM

Benefits

- High quality and service life
- Save on wiring costs for difficult installation conditions (e.g. moveable equipment parts) or for temporary installations
- Subsequent integration of an installed field device with 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 a 4 to 20 mA interface (without HART) can also be connected.
- Intelligent energy management to achieve the best possible life time 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 parameterization for the adapter and connected field devices.

Application

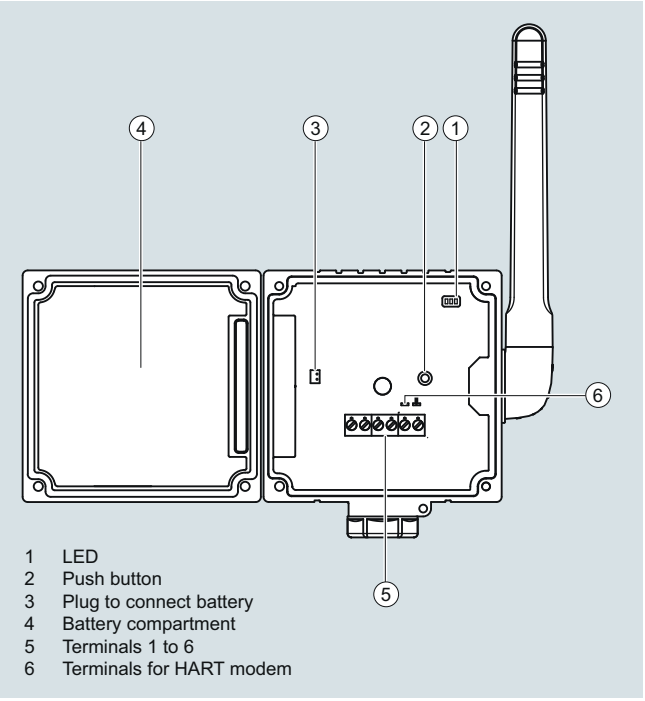
The WirelessHART adapter can be used in a number of different applications, e.g.

- Access to installed basis
  Diagnostic information is obtained from existing wired HART devices through a permanent electrical connection of a WirelessHART adapter, and is sent to an asset management software near the system, e.g. SITRANS MDS.
- Status monitoring of the plant
  Wireless devices are mounted at critical points in the plant, which are not usually connected to the control room due to difficult accessibility or extensive costs for wiring. Better data flow and diagnostics increase the system's reliability, transparency and safety.
- Process optimization
  A temporary installation of a standard 4 to 20mA or HART device together with the WirelessHART adapter SITRANS AW200 allows flexible monitoring and plant optimization at lower costs and reduced effort.
- Process monitoring
  Measured values from e.g. tanks or silos are transmitted to a superordinate system in regular time intervals, together with the device and battery status.

Design

The SITRANS AW200 WirelessHART adapter consists of

- A housing with mounted antenna
- Electronics
- A high-performance lithium battery unit



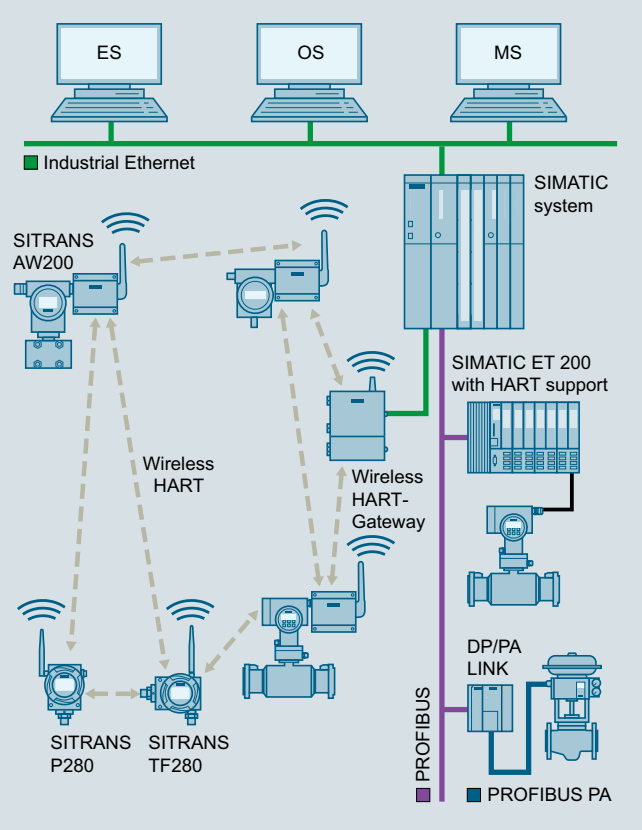
SITRANS AW200 WirelessHART adapter, assembly

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

The back of the housing features a connection part with a fixing nut onto which different replaceable connecting pieces can be screwed to mount the adapter directly on a field device.

The bottom of the housing contains an optional cable opening which can be used for a cable gland. In the case of an offset mounted adapter, it is possible to feed up to 2 cables.

Function



SITRANS AW200 WirelessHART adapter functional diagram

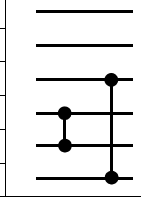
Measured values and diagnostic information of connected field devices with HART communication are transmitted via a wired connection to the WirelessHART adapter. The adapter transmits this information as wireless signals to a WirelessHART gateway. From here, the information is available to the network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

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

Following parameterization 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 the neighbors in the wireless network. A WirelessHART network organizes itself. Manual settings for organizational purposes 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, power 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.

Interface	Connection	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

Parameterization

The SITRANS AW200 configured via HART. This can be done using a handheld communicator or even more conveniently with a HART modem and the SIMATIC PDM parameterization software.

Initial start-up of the adapter is usually carried out via SIMATIC PDM and HART modem or a handheld communicator. During initial start-up, the network ID and join key is set up in the adapter, among others. Using these parameters, the adapter is then integrated into an existing WirelessHART network.

Once it is integrated into the network, the adapter and connected HART devices can be conveniently operated via the WirelessHART network or with the onsite HART modem.

Siemens HART field devices for the adapter

HART and 4 to 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. Please find current information about connectivity to field devices from Siemens as FAQ under http://www.siemens.com/automation/service&support.

Note:

Siemens will only approve the Siemens HART field devices listed there for the adapter, and will only supply technical support for these devices.

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

- All warranties and liabilities will be excluded.
- No technical support

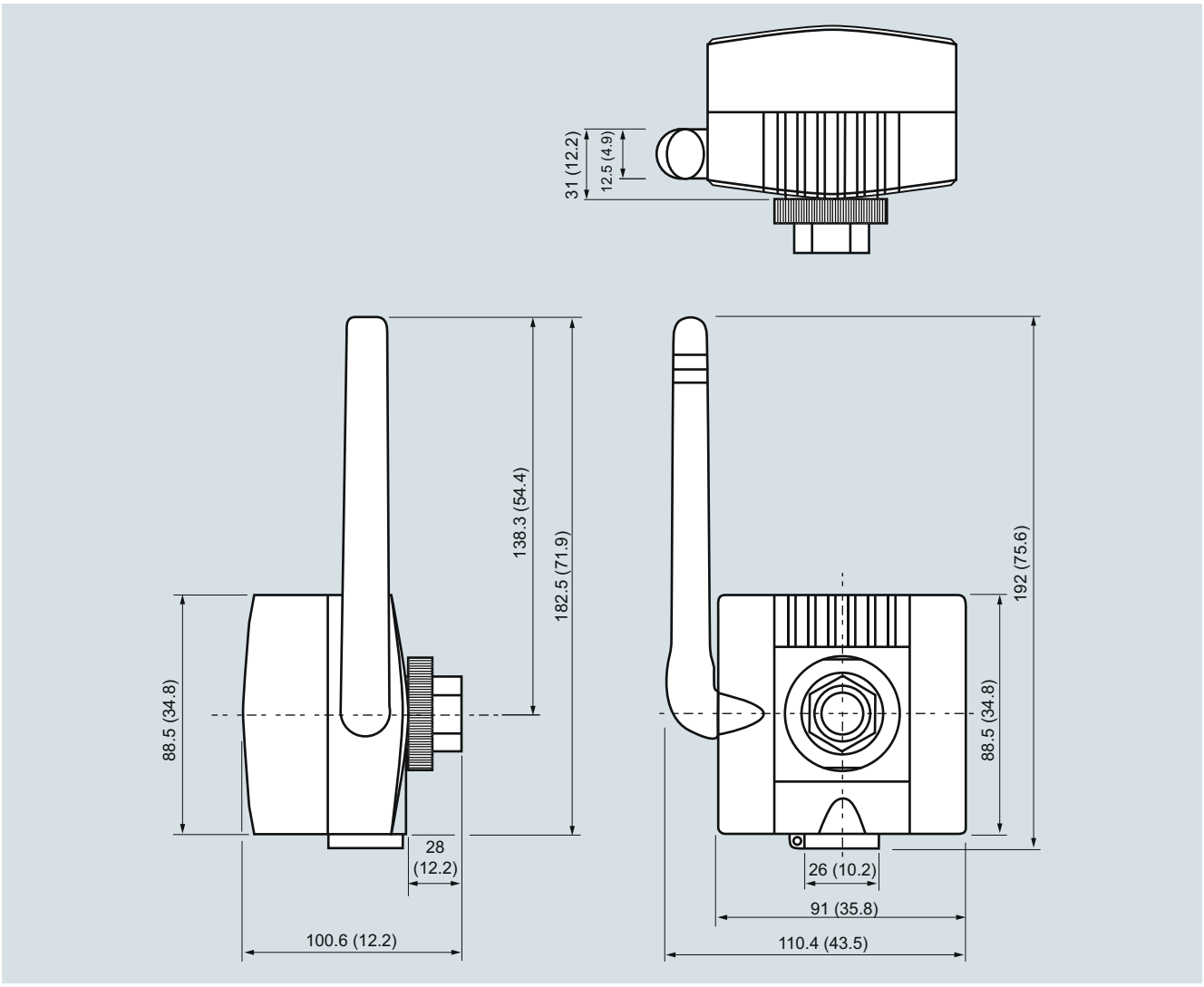
Technical specifications

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 multi-drop 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 multi-drop 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 three other variables may be selected from the following: adapter temperature, battery voltage, energy consumed, expected battery life time
• 4 ... 20 mA field device	Scaled or linearized process values
• HART field device	Up to four 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/10 K
Rated conditions	
Location	Outside/Inside
Ambient conditions	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F) The capacity of the battery decreases rapidly if 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	As per EN 61326, EN 301 489-1/17 and NAMUR NE 21

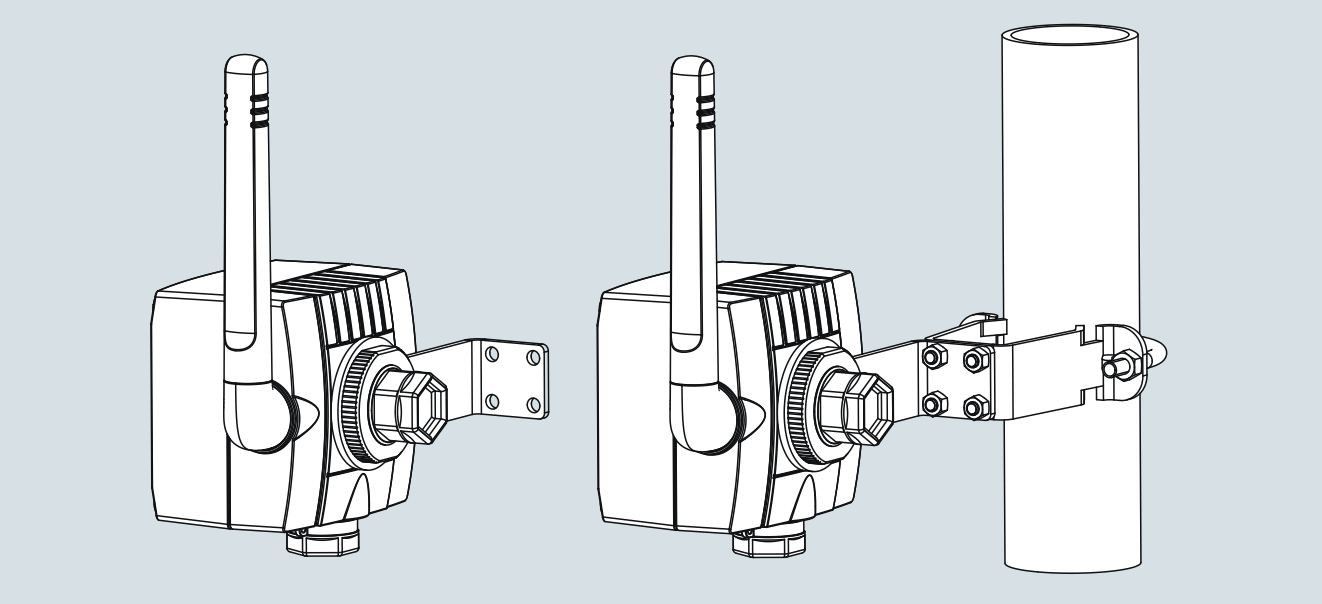
Design	
Weight	0.5 kg without battery, 0.75 kg with battery
Enclosure	
• Material	• Polyester (PBT FR) • Aluminium
• Cable entry	2x M20 x 1.5
Degree of protection	IP65, IP66; NEMA 4
Antenna	Omnidirectional dipolar aerial, vertical rotation
Mounting adapter	M20 x 1.5 on M20 x 1.5, M20 x 1.5 on G½, M20 x 1.5 on ½"- 14 NPT, M20 x 1.5 on ¾" -14 NPT
Power supply	
Battery	Lithium thionylchlorid high-performance battery unit
Supply voltage	5 ... 7.2 V DC
Capacity	19 Ah at 20 °C
Service life	Up to 5 years, depending on update rate, connected field device and ambient conditions
Voltage supply for one field device (independent of multidrop)	
• No-load voltage	8 ... 23 V DC
• Current	4 ... 20 mA DC (as per NAMUR recommendation NE 43)
• Fault current	I ≤ 3.6 mA or I ≥ 21 mA
• Protection	Short-circuit proof, activated at voltages > 25 mA
External voltage supply for one or more field devices (multidrop)	
• Voltage	< 30 V DC
• 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 300328
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 adapter for WirelessHART communication ↗	**7MP3112-**	■	■	■	■	■	**0**	**-**	**0**	**A**	**A**	**0**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.												
WirelessHART adapter AW200 with 4 ... 20 mA- or HART interface Without battery		**1**										
Power supply												
Battery powered			**A**									
Certificates and approvals												
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 General purpose				**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						**0**						
Aluminium						**1**						
Accessories												
Lithium battery for SITRANS AW200	**7MP3990-0AA00**											
Thread adapter for direct mounting of the adapter to a field device												
• M20 thread adapter	**7MP3990-0BA00**											
• Thread adapter G½	**7MP3990-0BB00**											
• Thread adapter ½" - 14 NPT	**7MP3990-0BC00**											
• Thread adapter ¾" - 14 NPT	**7MP3990-0BD00**											
Mounting bracket for attaching to wall/pipe, material: stainless steel SS304, including cable gland	**7MP3990-0CA00**											

Dimensional drawings

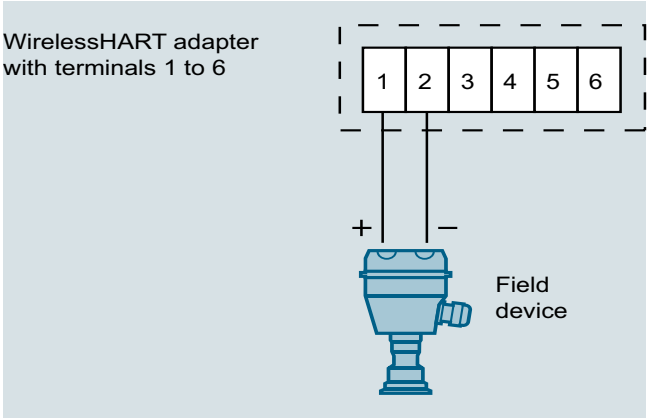


SITRANS AW200 WirelessHART adapter, dimensions in mm (inch)

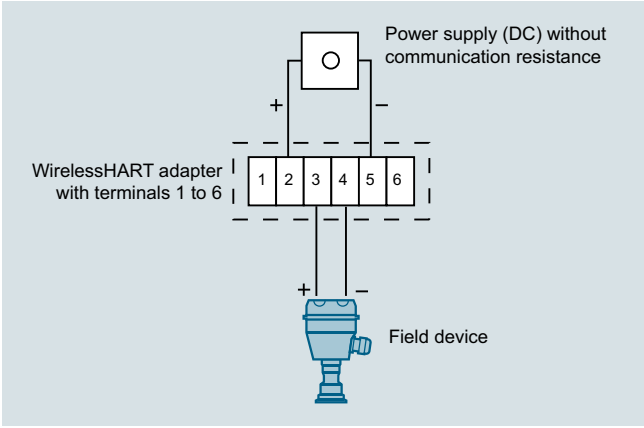


SITRANS AW200 with built-in mounting bracket for wall or pipe mounting

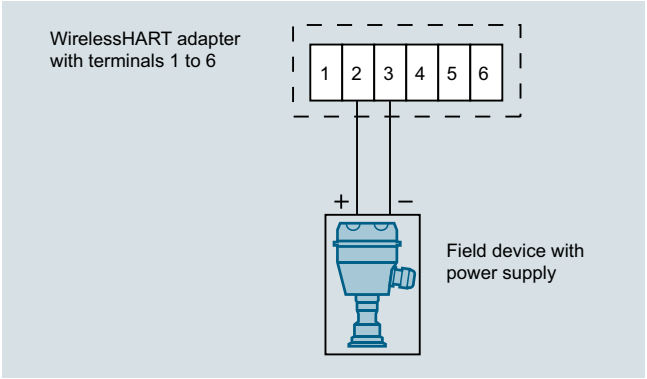
Schematics



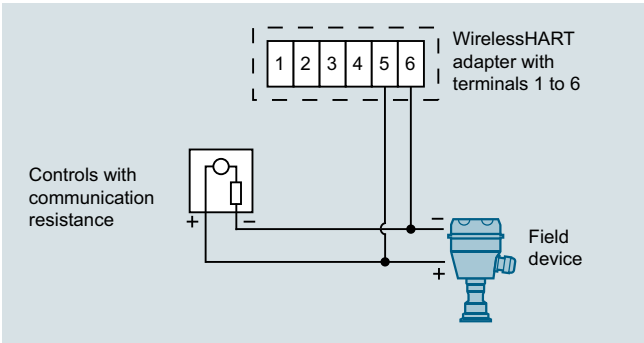
Connection of a two-wire field device, power supply provided by adapter



Connection of a two-wire field device with external power supply



Connection of a four-wire field device



Connection of adapter parallel to wired 4 to 20 mA communication