Communication and Software

WirelessHART Adapter SITRANS AW200

Operating Instructions · 01/2010

SITRANS

SIEMENS

SIEMENS

SITRANS

Smart wireless module with power supply for field devices WirelessHART Adapter SITRANS AW200

Operating Instructions

7MP3112-*

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE
indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation for the specific task, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be adhered to. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of the Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Table of contents

Introduction

1

1.1 Purpose of this documentation

Read these instructions carefully prior to installation and commissioning. The instructions contain all the information you need for commissioning and using the device. In order to use the device correctly, first make yourself acquainted with its principle of operation.

It is aimed both at persons mechanically installing the device, connecting it electronically, configuring the parameters and commissioning it as well as service and maintenance engineers.

1.2 History

The most important changes in the documentation when compared with the previous edition are shown in the following table.

Edition	Remark
01 12/2009	First edition. Product version 1.00.xx
02 01/2010	Extended Technical Specifications Additional information on national guidelines. Revised Internet links

1.3 Notes on warranty

The contents of this programming manual shall not become part of or modify any prior or existing agreement, commitment or legal relationship. All obligations on the part of Siemens AG are contained in the respective sales contract, which also contains the complete and solely applicable warranty conditions. Any statements on the device versions described in the programming manual do not create new warranties or modify the existing warranty.

The content reflects the technical status at the time of printing. We reserve the right to make technical changes in the course of further development.

1.4 Product information

The manual can be found on the supplied CD. The programming manual is also available on the Siemens homepage.

The CD also contains the technical specifications sheet with ordering data and the EDD.

See also

Catalog process instrumentation (http://www.siemens.com/processinstrumentation/catalogs)

Product information about SITRANS AW200 on the Internet (http://www.siemens.de/wirelesshart)

General safety instructions 2

2.1 General information

This device left the factory free from safety problems. In order to maintain this status and to ensure safe operation of the device, please observe the safety information and warnings contained in these instructions.

Safety information and symbols must be observed without exception. They must not be removed and must be maintained in legible condition at all times.

2.2 Correct usage

The device may only be used for the purposes specified in these instructions.

Insofar as they are not expressly stated in these instructions, all changes to the device are the sole responsibility of the user.

The WirelessHART adapter SITRANS AW200 is a smart wireless module: The adapter allows wireless transmission of 4 ... 20 mA HART signals of a connected field device to a WirelessHART gateway (for example Siemens IE/WSN-PA Link).

You will find information on the correct usage of the connected field devices and the WirelessHART gateway in the relevant operating instructions.

2.3 Qualified Personnel

Qualified personnel are people who are familiar with the installation, mounting, commissioning, and operation of the product. These people have the following qualifications:

- They are authorized, trained or instructed in operating and maintaining devices and systems according to the safety regulations for electrical circuits, high pressures and aggressive as well as hazardous media.

- For explosion-proof devices: They are authorized, trained, or instructed in carrying out work on electrical circuits for hazardous systems.

- They are trained or instructed in maintenance and use of appropriate safety equipment according to the safety regulations.

2.4 Installation, commissioning and operation

The WirelessHART adapter can be operated without danger if the current guidelines on technical safety and the current EU directives are adhered to. Field devices connected to the WirelessHART adapter must also be operated according to the current guidelines for technical safety and the current EU directives.

If the WirelessHART adapter is incorrectly installed or is used in applications other than those for which it is intended, this may result in dangerous situations. To avoid this, the WirelessHART adapter must be transported, stored, installed, connected, configured, operated and maintained according to the instructions in this manual. Personnel operating the device must be authorized and suitably qualified. These stipulations also apply to the battery unit.

2.5 Health and safety at work

Applications

The WirelessHART adapter meets the requirements of the EU directives for the various intended areas of application. The permitted conditions for use described in the section "Technical specifications" (Page 71) must be adhered to.

Hazardous area

The WirelessHART adapter is suitable for operation only outside hazardous areas.

Battery unit

The WirelessHART adapter is intended to supply a field device with power. The adapter therefore has a lithium thionyl chloride high-performance battery unit. The battery unit consists of two cells of the type SL-2780. This design has an effect on occupational health and safety. Keep to the regulations for avoiding danger in the accompanying safety data sheet.

Maintenance

⚠ WARNING
Explosion hazard
Never open the housing of the WirelessHART adapter within a hazardous area. Opening the housing, for example, during commissioning or replacing the battery is permitted only outside hazardous areas.
Invalidating the guarantee/wireless approval
Unauthorized modification or manipulation of the device electronics or the battery invalidate the guarantee and wireless approval.
The manufacturer accepts no liability for damage caused by unauthorized modifications to the device.

The housing of the WirelessHART adapter contains only one element requiring maintenance: the battery unit. It does not include any parts that can be repaired by the user.

If an error or fault occurs, return the device without the battery unit to Siemens AG.

Complete the decontamination declaration and send this along with the device to Siemens AG.

The decontamination declaration is available on the Internet. You will find the relevant addresses in Technical support (Page 75).

2.6 Conformity certificate

You will find all declarations of conformity on the supplied CD-ROM.

CE declaration of conformity

A CE declaration of conformity was issued for non-hazardous area versions. This declares that the WirelessHART adapter meets the relevant EU directives.

Electromagnetic compatibility

All modules are suitable for industrial applications and meet the EU directive 2004/108/EC "Electromagnetic Compatibility":

- Emission: EN 61326-1: 2006, class B

- Immunity: EN 61326-1: 2006 Tab. 2 (industrial environment) NE21

FCC and IC approval (IC = Industry of Canada)

This device meets Part 15 of the FCC regulations.

Operation is subject to the two following conditions:

- This device cannot cause dangerous interference.

- The device is not sensitive to interference that can cause unwanted operating states.

⚠ WARNING
Keep to the minimum distance between the device antenna and the human body
A distance of at least 20 cm must be maintained at all times between the body of the user or other persons in the vicinity whenever the device is in use.

Changes

The FCC requires that the user is informed of the fact that the authority of the user to operate the device can become invalidated by any modifications to the device not expressly approved by Siemens AG.

R&TTE approval

This device meets the directive on Radio and Telecommunications Terminal Equipment (R&TTE), 1999/5/EC: EN 300328

National guidelines

Observe the following national guidelines:

Country	Directive
Bulgaria	General authorization for operation in the open and in public required
Italy	A general authorization is required for operation outside company grounds.
Norway	Operation can be limited to a radius of 20 km around the city of Ny-Alesunds.
Romania	Operation as a secondary device: Special license required
Latvia	Operation in the open of the 2.4 GHz frequency range requires a national authorization.

Preparations for use

3

3.1 Unpacking

Visual inspection

When unpacking:

- Check the packaging for any visible damage resulting transportation.
- To avoid damage, remove the packaging carefully.
- Keep the original packaging in case you have to transport the WirelessHART adapter again.
- Please keep the accompanying documentation in a safe place.

> **CAUTION**
>
> **Do not put a damaged device into operation**
>
> If you find that the content is damaged, the device must not be put into operation. In this case contact your sales partner. Return the device to us, where possible in its original packaging.
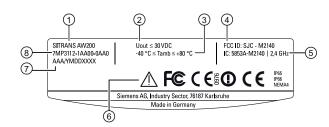
3.2 Identification of the device

Type plate

The type plate contains all the information you require to identify your device:

①	Product name	②	Electrical data
③	Field of application	④	Wireless approvals FCC / IC
⑤	Frequency range	⑥	Read the information in the operating instructions!
⑦	Serial number	⑧	Order number

Figure 3-1   Type plate

3.3   Components of the product

Checking the delivery

Check that the consignment is complete and nothing is missing before you start to put it into operation.

The delivery consists of the following:

- WirelessHART adapter with battery unit (if ordered)
- Brief description, CD-ROM

Optional

- Mounting support wall/pipe
- Cable for electrical connection of the WirelessHART adapter to a field device
- Coupling with double thread:

    M20, G 1/2, NPT 1/2 or NPT 3/4 with one EPDM seal

3.4 Storage and transport

Vibration and shock

Although the WirelessHART adapter has a rugged construction, some parts are sensitive to strong vibration and shock. This means that the WirelessHART adapter needs to be protected against excessive mechanical stress of this type.

Storage

We recommend that you store the device without the battery unit connected at temperatures from -40 °C to +80 °C. If you store the device with the battery unit connected, the storage temperature must not exceed +30 °C.

CAUTION
Avoid direct sunlight and the immediate vicinity of heating appliances
• Protect the WirelessHART adapter from direct sunlight.
• If the battery unit is connected, do not store the device in the vicinity of heating appliances.
• Keep to the environmental conditions listed in Technical data (Page 71).

Transportation

⚠ WARNING
Guidelines for transportation
The lithium thionyl chloride high-performance battery belongs to dangerous goods class 9 "Miscellaneous hazardous materials and substances".
If you transport the battery, the dangerous goods regulations listed in the accompanying safety data sheet apply. For more information, please contact your regional Siemens representative. Partner (http://www.automation.siemens.com/partner)

Mode of operation and system

<div style="text-align: right; font-size: 3em;">4</div>

4.1 Wireless HART network

Task of the WirelessHART adapter in the WirelessHART network

The WirelessHART adapter is a smart wireless module. The adapter connects up to four connected field devices over a wireless link to a WirelessHART network via each 4 to 20 mA or HART interface.

The WirelessHART adapter sends the measurement and diagnostics information of the field device in the form of wireless signals to the WirelessHART gateway. The gateway, for example a Siemens IE/WSN-PA Link, receives the information and makes it available in the plant network.
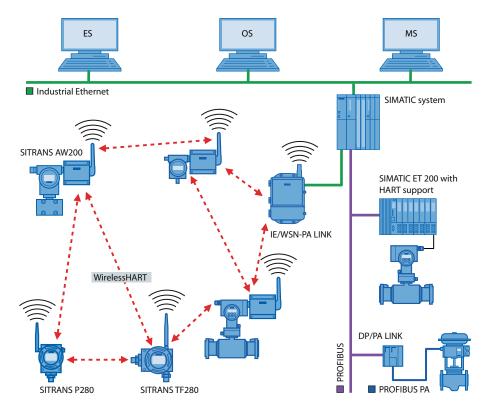

Figure 4-1   Wireless HART network

Due to technical conditions, it is often impossible to transfer diagnostics data from HART field devices to a higher-level process control system.

The WirelessHART adapter is capable of sending diagnostics data to a diagnostics station. The data can be evaluated centrally on the diagnostics station with the SIMATIC PD and SITRANS MD software tools. This has no detrimental effect on the process control system.
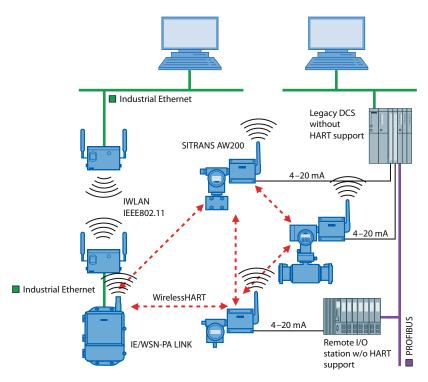

Figure 4-2   WirelessHART network with diagnostics station

The WirelessHART network is capable of organizing itself. This is the responsibility of the "Network Manager" software that automatically organizes, establishes and manages WirelessHART networks. The Network Manager software calculates the optimum connection paths between the network nodes and selects an alternative path via which the data will be sent if an error or fault occurs.

After installation, every WirelessHART adapter is capable of recognizing its neighbors. The WirelessHART adapter detects the strength of the wireless signal, synchronizes itself, obtains frequency information and then establishes connections to its neighbors in the wireless network. This means that the user is not required to make any settings regarding the organization of the network.

Power supply of the WirelessHART adapter

The power required by the WirelessHART adapter is provided by the supplied battery unit. The field device can be supplied by the battery unit or by a separate power supply. It is possible to connect two-wire and four-wire field devices.

If you use the battery to supply power to the field device, this shortens the life of the battery.

4.2   Siemens HART field devices for the adapter

Up to four HART and 4 … 20 mA field devices can be connected to the WirelessHART adapter SITRANS AW200. Depending on their electrical characteristics, the field devices can either be supplied with power by the WirelessHART adapter or you require an external power supply. Information on Siemens HART field devices for the adapter is available under: Services & Support (http://www.siemens.com/automation/service&support)

If the field devices are supplied by the adapter, it may be necessary to optimize settings for the power supply. You will find further information on this in the section Optimization of the power supply (supply by the adapter) (Page 65).

Assembling   5

5.1 Overview

Introduction

There are three options available for the mechanical installation of the WirelessHART adapter:

- Directly on the field device
- At a distance using a connecting cable
- As a router, in other words, without field device.

Depending on the application and field device connectors, various interchangeable couplings can be screwed into the mounting collar of the WirelessHART adapter.

Mounting accessories

Depending on what was ordered, the following mounting accessories are supplied with the WirelessHART adapter:

- 1 Coupling for mounting on a field device with M20, G 1/2, NPT 1/2 or NPT 3/4 connector.
- Mounting support for mounting on a wall or a pipe

5.2 Conditions for mounting

Introduction

The WirelessHART adapter is approved for stationary use in locations not protected from the weather.

☞ **More information**

For more information, refer to the section "Technical specifications". (Page 71)

Conditions for mounting

| NOTICE |
| --- |
| **The following mounting conditions must be adhered to** |
| To avoid attenuation of electromagnetic waves and the resulting impairment of performance, the following mounting conditions must be met during operation of the WirelessHART adapter: |
| • If you install the adapter at a distance from the field device, make sure that the antenna is at least 6 cm away from a wall or mast ①. |
| • Make sure that the antenna of the WirelessHART adapter is not located between a wall or a mast and the housing ②. |
| • Make sure that there is no metallic material parallel to the antenna with a clearance of less than 6 cm ③. |
| • Make sure that the antenna is aligned vertically and pointing upwards ④. |
| • If you are using more than one WirelessHART adapter, there should ideally be no wall or similar obstacle between them to guarantee an optimum wireless network. |
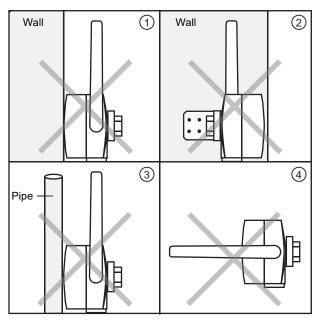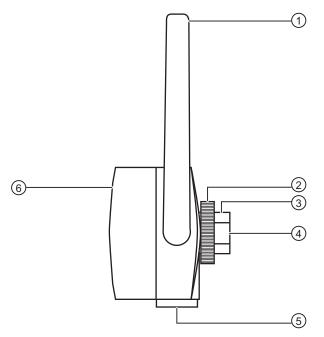
Figure 5-1   General installation instructions

Tools required for mounting

To mount the WirelessHART adapter, you need the following tool:

- Size 24 wrench
- Size 25 wrench
- Crosstip screwdriver PZ 1
- Slotted screwdriver with a blade width of 2.5 mm

5.3 Construction

①   Antenna

②   Locking nut

③   Mounting collar

④   Cable inlet for installation on the field device, inner thread M20x1.5

⑤   Secondary cable inlet, inner thread M20x1.5

⑥   Cover of the adapter with battery compartment

Figure 5-2   Side view of the housing

5.4 Housing dimensions
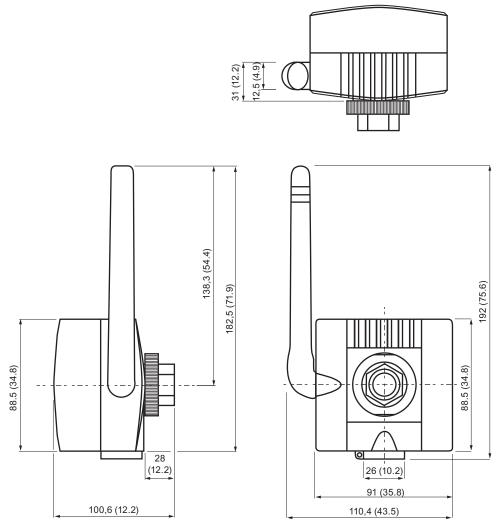
Figure 5-3   Housing dimensions in mm (inches)

5.5 Installation on the field device
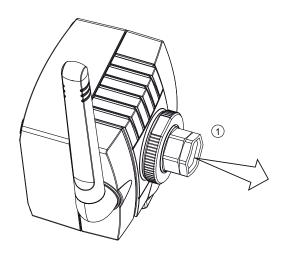
Note

If the locking nut is loosened, the connecting collar can be rotated without needing to turn the housing of the WirelessHART adapter.
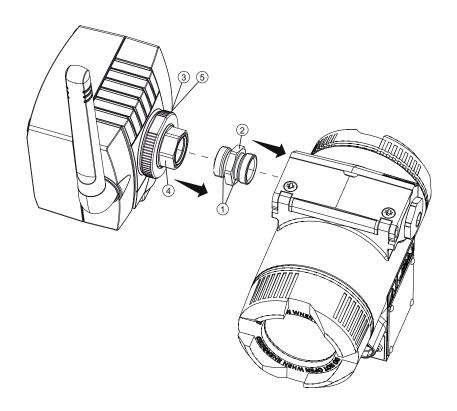
Installation

To install the WirelessHART adapter on the field device, follow these steps:

1. Remove the sealing cap ① on the mounting collar

2. Push one EPDM seal ① onto each end of the double-thread coupling ② up to the end of the thread.

3. Screw the coupling ② into the connector on the field device.

4. Release the locking nut ③ of the WirelessHART adapter.

5. Place the mounting collar ④ of the WirelessHART adapter on the coupling screwed into the field device and screw the connecting piece onto it using a wrench.

6. If necessary, align the adapter.

7. Tighten the locking nut ⑤.

5.6 Mounting at a distance

It may be necessary to install the adapter at a distance from the field device in a variety of situations. This might be, for example:

● There is not enough space to install the adapter on the field device.

● The reception of the wireless signals is not adequate where the field device is located.

● The vibration on the field device is higher than the recommended range.

The WirelessHART adapter can be secured to a wall, a mast or other objects. In this case the connection between the WirelessHART adapter and the field device is implemented with cable and cable connectors that do not ship with the product.

5.7 Wall and pipe mounting

Wall mounting
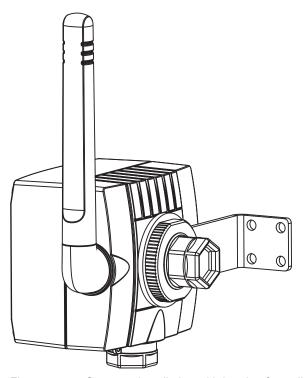
Figure 5-4   Separate installation with bracket for wall mounting

To install the WirelessHART adapter on a wall, follow these steps:

1. Unscrew the locking nut counterclockwise.

2. Insert the mounting collar of the WirelessHART adapter through the hole in the bracket.

3. Align the WirelessHART adapter so that you can position the antenna vertically when mounting is complete.

4. Fit the locking nut on the mounting collar and tighten the locking nut clockwise.

Pipe mounting

Mount the WirelessHART adapter on a pipe as shown in the figure "Separate installation with mounting support on a pipe".
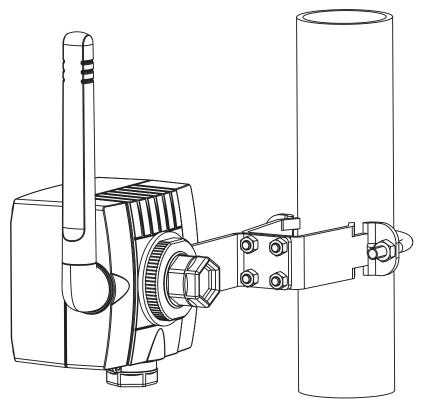
Figure 5-5   Separate installation with mounting support on a pipe

5.8 Checks after mounting

Checks after mounting the WirelessHART adapter

After mounting the WirelessHART adapter, make the following checks:

- Is the WirelessHART adapter damaged (visual check)?
- Does the WirelessHART adapter satisfy the specifications for the location such as ambient temperature, relative humidity etc.?
- Is the antenna correctly aligned?
- Is the WirelessHART adapter installed far enough away from a wall, a pipe or a mast?
- Is the mounting support for the wall/pipe correctly mounted?
- Have the mounting collar and locking nut been tightened?

Connecting

6

6.1 Electrical installation

6.1.1 Cabling when the adapter is mounted directly on the field device

Requirement

For the electrical installation of the WirelessHART adapter, you require a slotted screwdriver with a blade 2.5 mm wide.

Cable specification

CAUTION
Use the correct cable
• If the adapter is mounted directly, use the two-wire cable with a length of 38 cm supplied with the product.
• If you install the adapter away from the field device, you can use commercially available installation cable.
• If strong electromagnetic interference can be expected, for example from machines or wireless devices, we recommend that you use a shielded cable.
• Contact the shield only to the ground connector.

Cabling when the adapter is mounted directly on the field device

If the adapter is installed directly on the field device, follow these steps:

1. Open the housing of the WirelessHART adapter.

2. Insert the cable through the mounting collar.

3. Connect the cable as described in the section "Wiring diagrams" (Page 36) to the appropriate terminals of the WirelessHART adapter.

4. Wire up the field device according to the operating instructions of your field device.

6.1.2   Optional cable inlet/wiring via the optional cable inlet

Requirement

The optional cable inlet on the underside of the WirelessHART adapter can be used in the following situations:

- If you need to insert two cables, for example as described in the sections "Two-wire field device with external power supply without communications resistor" (Page 37) and "WirelessHART communication parallel to a wired HART installation" (Page 37).

- When it is preferable to mount the WirelessHART adapter above the field device when installing the adapter away from the device.
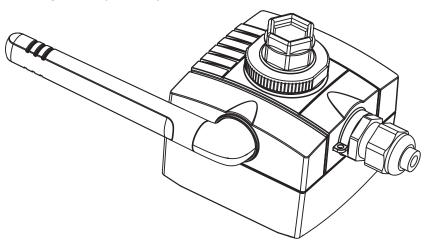
Figure 6-1   Feeding in the cable through the optional cable inlet

Cabling with the optional cable inlet

To feed a cable into the housing through the optional cable inlet, follow these steps:

1. Remove the sealing cap from the cable inlet of the WirelessHART adapter.

2. Screw the cable gland into the thread of the cable inlet.

3. Release the stress relief of the cable gland slightly by turning the union nut counterclockwise.

4. Open the housing of the WirelessHART adapter.

5. Feed the cable through the cable gland into the housing.

6. Connect the cable as described in the section "Wiring diagrams" (Page 36) to the appropriate terminals of the WirelessHART adapter.

7. Tighten the union nut.

See also

WirelessHART communication parallel to a wired HART installation (Page 40)

6.1.3   Connection values at the terminals

Input and output terminal values

Keep to the following input and output values at the terminals as shown in the wiring diagrams in the section "Wiring diagrams" (Page 36).

NOTICE
Due to the internal communications resistor, the supply voltage of the field device varies depending on the set current and no-load voltage.

- Power supply for field devices (terminal 1):
  - No-load voltage can be set between 8 V and 23 V in steps less than 0.1 V
  - Electric current: 4 mA DC ≤ I_{out} ≤ 20 mA DC (according to NAMUR recommendation NE 43)
- 4 bis 20 mA/HART input (terminal 2):
  - Electric current: 4 mA DC ≤ I_{in} ≤ 20 mA DC (according to NAMUR recommendation NE 43)
- High-resistance HART input/output connectors (terminals 4, 5, 6):
  - Input impedance 3.7 kΩ for HART communication
  - Input impedance DC = ∞

Checking the terminal connections

After wiring up the WirelessHART adapter, make the following checks:

- Are the terminals wired up correctly?
- Is the cable gland tight?

6.2 Wiring diagrams

6.2.1 Overview

Options for connecting the WirelessHART adapter to a field device

There are various options for connecting the WirelessHART adapter to a field device electrically:

● Connection of a two-wire field device and supplying the device with power

● Connection of a four-wire field device

● Connection of a two-wire field device with external power supply without communication resistor

● WirelessHART connection parallel to wired HART communication

Select which of these options you require for your installation.

6.2.2 Two-wire field device with power supply for the device

When you connect a two-wire field device, the following functions are possible via terminals 1 and 2:

● Power supply of the field device

● Current measurement in the range from 4 to 20 mA

● Digital HART communication

Connect up the WirelessHART adapter as illustrated:

Figure 6-2   Connection of a two-wire field device and supplying the device with power

6.2.3 Four-wire field device

When you connect a four-wire field device, the following functions are possible via terminals 2 and 3:

● Current measurement in the range from 4 to 20 mA

● Digital HART communication

Connect up the WirelessHART adapter as illustrated:

Figure 6-3   Connection of a four-wire field device

6.2.4 Two-wire field device with external power supply

This section includes information on the connection of two-wire field devices with external power supply that are not equipped with a communication resistor for HART communication.

If there is a communication resistor, then the following connection guidelines will apply:

WirelessHART communication parallel to a wired HART installation (Page 40) .

Standard connection variant

With this connection variant of the WirelessHART adapter, the following functions are possible:

● Current measurement in the range from 4 to 20 mA

● Digital HART communication
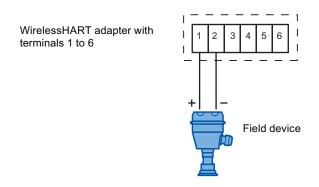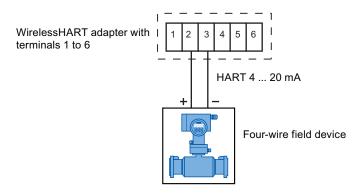
Connect up the WirelessHART adapter as illustrated:

Figure 6-4   Connection of a two-wire field device with external power supply without communication resistor (alternative 1)

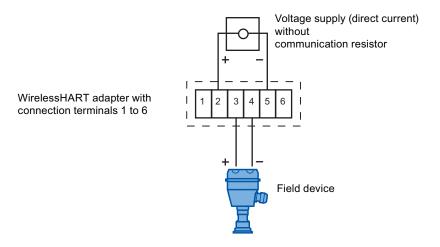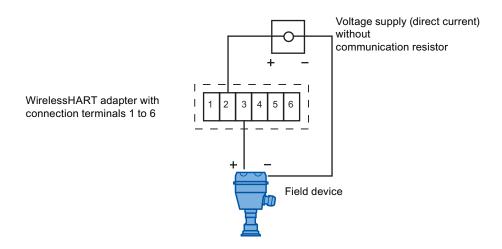Figure 6-5   Connection of a two-wire field device with external power supply without communication resistor (alternative 2)

Multidrop connection

With this connection variant, up to four two-wire field devices with external power supply can be connected to the adapter.

Connect up the WirelessHART adapter as illustrated:
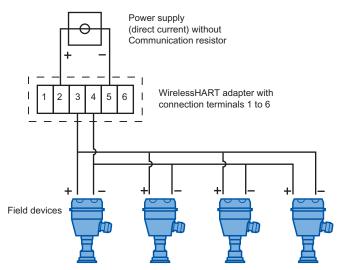
Figure 6-6   Multidrop connection

6.2.5   WirelessHART communication parallel to a wired HART installation

Existing installation

The WirelessHART adapter can be connected to an existing installation consisting of power supply including communication resistor and HART field device: Digital communication is possible.

Connect up the WirelessHART adapter as illustrated:
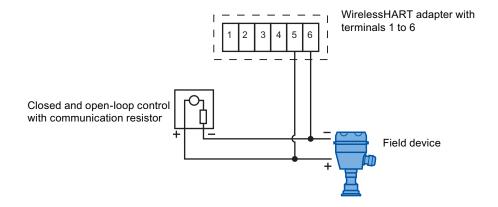
Figure 6-7   WirelessHART connection parallel to wired HART communication

New installation

With a new installation consisting of closed-loop and open-loop control including communication resistor and HART field device, the following connection variant is recommended:
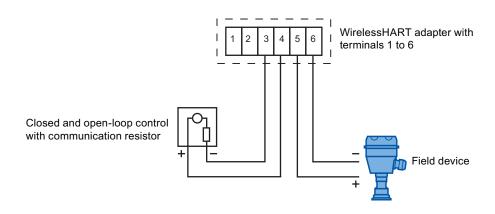
Figure 6-8   Parallel WirelessHART connection when installing a new field device
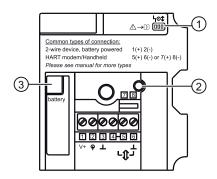
Operation (hardware) 7

7.1 Display elements and operator controls

⚠ WARNING
The housing of the WirelessHART adapter must not be opened inside hazardous areas.
See also the section "Occupational health and safety" (Page 11).

The following display and control elements are visible inside the WirelessHART adapter:

①	LEDs	⌐	Red: Active communication, error message
		⊙	Yellow: Communication status
		↕	Green: Battery status
②	Pushbutton		
③	Socket for battery connector		

Figure 7-1   Display and control elements on the board cover

7.2   Indicator

The three LEDs colored red, green and yellow indicate the following statuses:

Yellow LED: Communication status

Yellow LED	Communication status	Meaning
Lit	Connected with alternative path	The adapter has joined to the network: • An alternative communication path exists.
Flashes at 1 Hz	Connected without alternative path	The adapter has joined to the network: • A alternative communication path does not exist.
Flashes at 3 Hz	Joining network	Connection currently being established, for example for 40 minutes after connecting the battery unit: • Time can be configured
Off	Not connected	No connection exists

Green LED: Battery status

Green LED	Communication status	Meaning
Lit	Normal	The battery unit is good for at least one month
Flashes at 1 Hz	Warning	The battery unit is good for less than one month
Flashes at 3 Hz	Alarm	Measurement was stopped on the field device: • A connection is not guaranteed. • The WirelessHART adapter can still be operated: Supply of the field device is no longer possible.
Off	Empty	The battery unit is empty or not connected

Red LED: Active communication, error message

Red LED	Communication status	Meaning
Lit	Internal error	Problem with device-specific cause: • The problem cannot be corrected by the user.
Flashes at 1 Hz	External error	It may be possible for the user to correct the problem. a) Temperature is outside the specified range. b) Measured value is outside the set range, for example 4 ... 20 mA.
Flashes at 3 Hz	Short-circuit	Short-circuit on terminals 1 and 2
Flashes: • 50 ms on, • 950 ms off	Communication mode active	It is possible to communicate with the WirelessHART adapter or the connected field device

Displays on the field device

Operate your field devices as explained in the relevant operating instructions.

7.3 Pushbutton

Various functions can be executed by pressing the pushbutton. The various functions depend on how long the button is pressed.

During commissioning

Note

For more information, read the section Commissioning (hardware) (Page 45).

Time pressed	Function
Requirement: The battery connector must be disconnected.	
1. Press the pushbutton	-
2. Insert the battery connector.	The red LED lights up: No function
3. Keep the button pressed.	The red LED flashes.
Keep pressed 10 ... 15 s	The red LED flashes. • Frequency 2.5 Hz (2.5 times/s on and 2.5 times off): • The configuration is reset to the default settings of the vendor.
Keep pressed 20 ... 25 s	The red LED flashes. • Frequency 1.25 Hz (1.25 times/s on and 1.25 times off): • The firmware and the configuration are reset to the default settings of the vendor. .

During operation

Time pressed	Function
≤ 0.2 s	No function
> 0.2 ... 5 s	LED function test
5 to 10 s	• Activates connection establishment: • Yellow LED flashes at 3 Hz (3 times/s on and 3 times off).
10 to 15 s	• Activates the mode for configuration of the connected field device. • Red LED flashes at 3 Hz (3 times/s on and 3 times off).
	The mode for configuring the connected field device is exited, the red LED goes off: • If no HART communication takes place during the configurable period of, for example, 300 s. • When the button is pressed a second time for 10 ... 15 s.
> 15 s	No function

Commissioning (hardware)

8

8.1 Installing and connecting the battery unit

Opening the housing/enclosure

⚠ WARNING
Risk of explosion
The housing of the WirelessHART adapter must not be opened inside hazardous areas.

- You need to open the housing to insert the battery unit. See also the section "Occupational health and safety" (Page 11).
- To open the housing, you require a crosstip screwdriver PZ 1.

Connecting the battery unit

CAUTION
Battery unit
Use of non-approved or damaged battery units may result in damage to the device or in the environment.
Only use the battery type approved by the manufacturer. Before you install or remove a battery unit, make sure that it is not damaged.

NOTICE
The performance of the battery is impaired if the ambient temperature is too high or too low
• A low ambient temperature causes a voltage drop in the battery unit, possibly to a point that the device can no longer be operated.
• A high ambient temperature causes limitation of the power of the battery unit due to self discharge.

Note

Minimizing current consumption with the multidrop mode

To minimize the power consumption, we recommend HART communication between field devices and the WirelessHART adapter in multidrop mode. Here, the analog current signal is frozen at 4 mA.

Note

Qualified Personnel

Installation and removal of the battery unit must only be carried out by qualified personnel.
Additional information is available under: Qualified Personnel (Page 9) .

---

①	LEDs	②	Pushbutton
③	Socket for battery connector	④	Battery compartment
⑤	Terminals 1 ... 6	⑥	Connecting eyes for HART modem
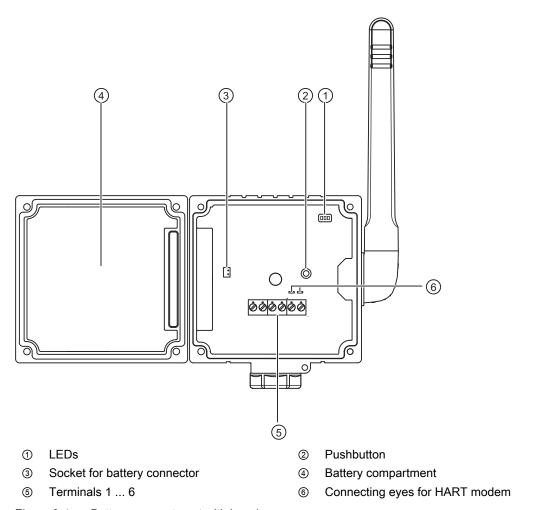
Figure 8-1   Battery compartment with housing open

To connect the battery unit, follow these steps:

1. If the battery unit is not yet inserted, insert it in the battery compartment.

   Make sure that the battery unit locks audibly in the battery compartment.

2. Plug the battery connector into the socket on the board cover.

Once the WirelessHART adapter is supplied with current, the operating software starts up. A
self test is then performed on the WirelessHART adapter to check whether the attachments
to the terminals have been changed.

If the device is starting up for the first time, the attachments to the terminals are detected.

8.2 Putting into operation with the pushbutton

Pushbutton during commissioning

Time pressed		Function
Requirement: The battery connector must be disconnected.		
1.	Press the pushbutton	-
2.	Insert the battery connector	The red LED lights up: No function
3.	Keep the button pressed.	
	Keep pressed 10 ... 15 s	The red LED flashes. • Frequency 2.5 Hz (2.5 times/s on and 2.5 times off): • The configuration is reset to the default settings of the vendor.
	Keep pressed 20 ... 25 s	The red LED flashes. • Frequency 1.25 Hz (1.25 times/s on and 1.25 times off): • The firmware and the configuration are reset to the default settings of the vendor. .

☞ **More information**

Read the section "Operator control (hardware)" (Page 41) to see which functions you can perform during operation of the WirelessHART adapter by pressing the pushbutton.

8.3 Checks after commissioning

Checking the commissioning of the WirelessHART adapter

During commissioning of the WirelessHART adapter, make the following checks:

- Is the battery unit correctly inserted and the battery connecting cable correctly plugged in?

- Is the device ready for operation and do the LEDs light up after briefly pressing the pushbutton?

Checking after commissioning of the WirelessHART adapter

After commissioning of the WirelessHART adapter, make the following checks:

- Is the housing cover screwed tight?

Parameter assignment/addressing

<div align="right">9</div>

9.1 Operating functions using HART communication

Introduction

The full functionality of the WirelessHART adapter is available using HART communication.

- The HART communicator and PC software are not supplied with the WirelessHART adapter.
- How to connect and operate a HART communicator or the PC software with a WirelessHART adapter is described in a separate manual and in the online help for both these tools.

Requirements for operator control via HART communication

You can operate the WirelessHART adapter via HART communication. The following is required for this purpose:

- A HART communicator or PC software such as SIMATIC PDM.
- A HART modem to connect a PC to the WirelessHART adapter or a connecting cable to connect a HART communicator to the WirelessHART adapter.

Note
Using SIMATIC PDM

The following software requirements apply when you use SIMATIC PDM as configuration tool:

- Use EDD device description as of SIMATIC PDM V6.0 only
  with Service Pack 5 and Hotfix 2 (SIMATIC PDM V6.0 + SP5 + HF2).
- Make sure that the latest device version has been imported in SIMATIC PDM before you install the EDD device description.

Note
Quick start wizard of the EDD

The EDD device description includes a quick start wizard that supports you during commissioning of the WirelessHART adapter.

Range of parameter assignment options

Once you have set up HART communication to the WirelessHART adapter, you can make suitable parameter settings for the WirelessHART adapter.

You can do the following:

● Configure communication between the WirelessHART adapter and the connected field device and to a WirelessHART network.

● Adapt properties of the connected field device relating to communication with the WirelessHART adapter.

● Adapt the power supply from the WirelessHART adapter to achieve a long working life for the installed battery.

Note

Parameter assignment recommendation

The adapter supports the connection of devices and configuration tools using different terminals.

In case of wire-bound parameter setting, the adapter may switch to other terminals so that communication with the adapter can be briefly interrupted. This effect occurs in the following cases:

● The adapter searches for newly connected devices

● Information about a connected device will be queried wired or wireless.

It may become necessary to establish the connection again, depending on the used configuration tool.

We recommend that you proceed as follows to prevent this behavior:

1. Configure the adapter basically for wireless communication, for example, with the quick start wizard in SIMATIC PDM.

2. Make additional configuration settings wireless using a WirelessHART Gateway.

9.2 Identification

Here, you can configure the parameters required to identify the WirelessHART adapter. The default settings are shown in the relevant input boxes.

The following list contains information about the structure of these input boxes and the format in which you can enter information in these boxes:

Parameter	Meaning	Example	Default
Long TAG	ASCII string with a maximum of 32 characters. • Used to identify the WirelessHART adapter in the network	AW001	
TAG	String with a maximum of 8 characters. • Used to identify the adapter in the network • Only a limited character set can be used: @ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [\ ] ^ _ blank ! " # $ % & ' ( ) * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? • In many plants, this identifies the location and the function of the field device.	LI1201	
Description	String with a maximum of 16 characters with which the user can, for example, describe the location of the WirelessHART adapter. • Only a limited character set can be used: @ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [\ ] ^ _ blank ! " # $ % & ' ( ) * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ?	Area 2 Tank 3	
Date	Date in dd.mm.yyyy, for example the date of the last change.	10.10.2009	01.10.2009
Message	Message with a maximum of 32 characters that can be used for any purpose. • Only a limited character set can be used: @ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [\ ] ^ _ blank ! " # $ % & ' ( ) * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ?		
Polling address	HART address of the WirelessHART adapter • Default setting 15 • Range 0 ... 63	15	15
Serial number	Serial number of the WirelessHART adapter		
Order number	Order number of the WirelessHART adapter		
Order number extension	Extension to the order number		
Country	Code for the country in which the WirelessHART adapter is operated.	DE	DE
SI units	All the unit-related parameters of the WirelessHART adapter can be selected. • SI units only • All	SI units only	All

9.3 Wireless communication

Here, you configure the parameters required to integrate the WirelessHART adapter in a wireless network.

With the network identification and four-part join key, the WirelessHART adapter can be integrated in an existing WirelessHART network. For security reasons, the join key is not shown in the offline table since this is the password that the WirelessHART adapter uses to connect to the WirelessHART network. The join key can only be entered with the quick start wizard or in online mode using the "Wireless settings" device function.

Parameter	Meaning	Example	Default
Network ID	Identification number of the network to which the WirelessHART adapter connects. • Range 0 ... 65535	43	0
Wireless mode	Display of the join network process of the WirelessHART adapter. • Idling • Active search • Negotiate: Join parameters are negotiated with the Network Manager. • Blocked: Denied by Network Manager and temporarily excluded from the network. • In operation: Connection established • Terminated: Permanent exclusion • Deep sleep/ultra low power/passive scan: Inactive		
Radio output power	Power of the radio signal. • 0 or 10 dBm • National restriction to 0 dBm possible	10 dBm	10 dBm
Join key part 1 of 4	Network password, 8 characters, format: hexadecimal, part 1 of 4.		
Join key part 2 of 4	Network password, 8 characters, format: hexadecimal, part 2 of 4.		
Join key part 3 of 4	Network password, 8 characters, format: hexadecimal, part 3 of 4		
Join key part 4 of 4	Network password, 8 characters, format: hexadecimal, part 4 of 4.		
Network search time [s]	Time for active join attempts in s after entering the correct "join key" and the correct "network ID". • Following this, the WirelessHART adapter continues to attempt to join the network, however with reduced intensity; the yellow LED goes off.	3600	3600

Parameter	Meaning	Example	Default
Join mode	The way in which the WirelessHART adapter joins the network: • Do not attempt to join: Do not join network • Join now: Join the network • Attempt to join immediately on power up or reset: Join the network immediately after a restart	Attempt to join immediately on power up or reset	Attempt to join immediately on power up or reset
Join now	If you press this button, the "network search time" and "join mode" are written to the WirelessHART adapter and then used. • If the "join mode" is set to "join now", the WirelessHART adapter attempts to join the network.		
Join status	Provides further details on the current status during the attempt to join the network: • Wireless signal found • Wireless signal identified • Wireless time synchronized: Synchronized with the network in terms of time • WirelessHART signal identified • Network admission requested • Join retrying • Join failed • Network security clearance granted • Network joined • Network bandwidth requested • Connection was established		
Neighbor count	Specifies the number of WirelessHART devices in the neighborhood to which a connection is established.		
Number of requests	Specifies the number of packages requesting entry to the network sent by neighboring devices or network managers and received by the WirelessHART adapter.		
Join attempts	Specifies the number of attempts made by the WirelessHART adapter to join the network before it succeeded.		
Network search time [s]	Time in seconds during which the WirelessHART adapter attempts to allow other adapters faster connection establishment to the network.		
Request Active Advertising	Pressing this button activates the "network search time" on the WirelessHART adapter.		

9.4 Wired communication

Here, you configure the parameters required to set up HART communication between the WirelessHART adapter and one or more HART devices.

The following list contains information about the structure of these input boxes and the format in which you can enter information in these boxes:

Parameter	Meaning	Example	Default
Polling address	HART address of the WirelessHART adapter. • Default setting 15 • Range 0 ... -63	63	15
Master mode	In a current loop, a device configurator such as SIMATIC PDM and the WirelessHART adapter (as examples) must be assigned different HART master types. • The default setting is primary master • There is a primary master and a secondary master. • If you connect a device configurator or a another master/host, this must be set to secondary master.	Primary master	
Num. response preambles	Number of preambles sent at the start of the HART frame to synchronize wired communication. • Range 5 ... 20	5	
Retry count	Number of attempts made by the WirelessHART adapter to establish communication with the connected field device before a connection error is signaled.	3	3
Lowest scan address	Address at which the WirelessHART adapter begins to search for connected field devices.	0	0
Highest scan address	Address up to which the WirelessHART adapter scans for connected field devices.	1	1

9.5 Illustration of the device variables of the adapter

The WirelessHART adapter can output the value and status of various variables. Four variables can be represented in the network. They can be represented and configured with SIMATIC PDM.

The following list contains information about the structure of these input boxes and the format in which you can enter information in these boxes:

Parameter	Meaning	Example	Default
Primary variable	First variable • The variable is linked directly to the measured current value.		
Unit of the primary variable	Unit of the primary variable	l	mA
Secondary variable	Second variable	Temperature	Temperature
Unit of the secondary variable	Unit of the secondary variable	°C	°C
Tertiary variable	Third variable	Battery voltage	Battery voltage
Unit of the tertiary variable	Unit of the third variable	V	V
Quaternary variable	Fourth variable	Estimated lifetime	Normalized consumed energy
Unit of the quaternary variable	Unit of the fourth variable	d	Ah

9.6   Configuration of 4 to 20 mA communication

A field device with 4 to 20 mA communication can be connected to an adapter. The 4 to 20 mA signal can be adapted and, when necessary, linearized. In addition to this, limit values can be entered that specify the proportional value range and the alarm signals. If the entered values are undershot or overshot, a warning or an alarm signal is sent by the WirelessHART adapter.

The following list contains information about the structure of these input boxes and the format in which you can enter information in these boxes:

Parameter	Meaning	Example	Default
Transfer function	The linearization table can be enabled and disabled. • On: the linearization table is enabled, the X and X values of the characteristic curve are disabled. • Off: the linearization table is disabled, the X and X values of the characteristic curve are enabled.	Linear	Linear
End value	Upper range end value of the input current that corresponds to the 20 mA value.	100 °C	20 mA
Start value	Lower range end value of the input current that corresponds to the 4 mA value.	-20 °C	4 mA
Damping	Damping factor of the input current (0 ... 255 s). • Currently disabled	0	0
Upper fault current value	An error is signaled if this value is exceeded.	22 mA	22 mA
Upper limit of proportional range	An warning is output if this value is exceeded.	20.5 mA	20.5 mA
Lower limit of proportional range	An warning is output if this value is undershot.	3.8 mA	3.8 mA
Lower fault current value	An error is signaled if this value is undershot.	3.6 mA	3.6 mA
Trim Loop Current Zero	Pressing this button calls a method for trimming the 4 mA value. • To do this, you simulate 4 mA on the connected field device or set a current of 4 mA in a different way. You will find the functions in the menu.		
Trim Loop Current Gain	Pressing this button calls a method for trimming the 20 mA value. • To do this, you simulate 20 mA on the connected field device or set a current of 20 mA in a different way.		

Parameter	Meaning	Example	Default
X1 ... X32	Input value X1 ... X32 for linearization (mA). • The values must increase monotonically		
Y1 ... Y32	Output values Y1 ... Y32 for linearization (unit of the primary variable) • Values must increase or decrease monotonically.		

9.7 Configuring burst mode

Burst mode is a special mode of the slave device that allows the slave to send signals periodically without being requested to by the master. Using burst mode, for example, process values can be sent to the gateway at regular intervals. Up to ten different burst mode messages can be defined.

The following list contains information about the structure of these input boxes and the format in which you can enter information in these boxes.

Parameter	Meaning	Example
Burst mode	Specifies whether or not burst mode is enabled. • Off: Burst mode is not enabled. • Enabled in WirelessHART	Wireless
Subdevice index	Based on the relevant long TAG, the subdevice index lists the connected HART field devices and the adapter so that they can be selected for the burst mode configuration. In HART field devices with a HART version 5 or lower, the "Message" parameter is shown in the subdevice index instead of the long TAG.	Tank 5
Update period [s]	If the "message trigger mode" is set to "continuous", this parameter specifies the time that elapses between two burst messages • If the other "trigger modes", this time is used to specify how often the condition ("burst trigger level") is checked.	00:10:00
Maximum update period [s]	The "message trigger mode" is set to a value other than "continuous": If the condition ("burst trigger level") is not met, the maximum time in seconds that may elapse between burst messages is specified.	01:00:00
Burst message trigger mode	Decides the event that triggers a burst message from the device.	Continuous
Burst trigger class	Specifies the classification of the message	Volume
Burst trigger unit	Unit of the measured value	l
Burst trigger level	Specifies the threshold value for changing from "update period" to "maximum update period": From the fast to the slow setting and vice versa. • The type of switchover is specified in the "message trigger mode".	200

Parameter	Meaning	Example
Burst command number	Burst command number • 1: Transfers the value of the primary variable and its unit. • 2: Transfers the value of the 4 ... 20 mA signal and the corresponding value as a percentage. • 3: Transfers the value of the 4 ... 20 mA signal and up to 4 predefined dynamic variables ("primary variable", "secondary variable", "tertiary variable", "quaternary variable") and their unit • 9: Transfers the value, the unit and the status of up to 8 field device variables. • 33: Transfers the value and the unit of up to 4 field device variables. • 48: Transfers the entire device status. **Note:** 1. Any commands can be set for connected field devices. Refer to the relevant operating instructions. 2. If in doubt: Use command 3.	3
Burst variable	Selection of the device variables to be transferred with the burst message, if command 9 or command 33 was selected as the burst command number. • Select the field device variable to be transferred from the list (this is only possible for the WirelessHART adapter). • If you want to set the burst for a connected field device, check the operating instructions of the field device for the assignment of device variables.	

9.8 Configuring event monitoring

Configuring event monitoring

Event notification is a special application within the burst mod. When there are changes in the device configuration or in the device status, an event notification is sent. This occurs regardless of whether data is sent due to other burst mode commands. The status in the device status byte, in the extended device status byte and in command 48 can be used for the event notification. It is possible to define a certain number of bits that trigger an event notification.

Event notifications have a low priority. They nevertheless have a time stamp to record when a notification was triggered the first time.

Up to 5 different event notifications can be defined.

The following list contains information about the structure of these input boxes and the format in which you can enter information in these boxes.

Event notification

Parameter	Meaning	Example
Event notification mode	Specifies whether or not the event monitoring mode is enabled. • Off: Event monitoring mode is not enabled • Enabled in wireless: Event monitoring mode is enabled	Wireless
Subdevice index	Based on the relevant long TAG, the subdevice index lists the connected HART field devices and the adapter so that they can be selected for the event monitoring configuration.	Tank 5
Event notification retry time	Time in seconds between transferring unacknowledged event notification. • The transfer of event notifications is continued until the WirelessHART adapter receives confirmation of receipt.	60
Maximum update period	If there is an event change, the maximum period in seconds is used. • If there is no event, the WirelessHART adapter sends an event notification after this time has elapsed.	3600
Event debounce interval	The time in seconds that a condition must persist before the event notification is sent.	3600
Event status	Indicates whether and which event notification was sent and has not yet been acknowledged.	
Time first unack. event triggered	Indicates how long the event notification shown in "event status" has existed (in seconds).	1

Event mask

Parameter	Meaning	Example
Event mask	To enable the required event notification, select the relevant check box. These event notifications are standardized.	

Device-specific event group

Parameter	Meaning	Example
Device-specific status	These are the device-specific non-standardized event notifications. These are described in the operating instructions of the field devices and can be enabled as explained there.	

9.9 Configuring power supply

Adapting the power supply of the WirelessHART adapter to the power requirements of the connected device extends the life of the battery. Identifying the power requirements allows a more reliable prediction of the life of the battery.

The power supply parameters for the field device must be taken from the relevant operating instructions.
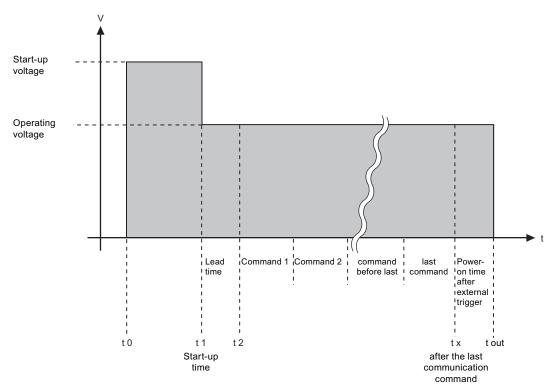
Figure 9-1   Power supply parameters

If the WirelessHART adapter supplies the field device as described in the section "Electrical installation: Wiring diagrams: Two-wire field device with power supply of the device" (Page 36), the following input boxes must be completed:

Parameter	Meaning	Example	Default
Configuration mode	Specifies the power mode. • Off: There is no communication with any connected field device. The WirelessHART adapter is used, for example, as a router between other WirelessHART devices. • Auto: If the connected field device is controlled via wireless, it is supplied with power following each communication according to the "Power-on time after external trigger": This suppresses constant turning on and off. • Configuration: If "configuration" is selected, the connected field device is supplied with power for the "configuration time" and then returns to "auto" mode. The same happens when the pushbutton is pressed for 10 ... 15 s on the WirelessHART adapter.	Automatic	Automatic
Start-up voltage	Voltage in volts that the connected field device requires in the range 8 ... 23 V in steps of 0.1 V	14 V	16 V
Start-up time	Time in seconds during which the field device requires the "start-up voltage".	5 s	5 s
Start-up current	Current in milliamperes required by the field device for the "start-up time".	14 mA	14 mA
Operating voltage	Voltage in volts that the field device requires in normal operation after the "start-up time".	12 V	16 V
Lead time	Time in seconds after the "start-up time" that the field device requires to provide valid measured values.	10 s	10 s
Power-on time after external trigger	Time in seconds during which the field device is supplied with current following communication via wireless. • Requirement: The configuration mode "auto" must be selected.	90 s	10 s
Configuration time	Time in seconds during which the field device is supplied with current for configuration (with SIMATIC PDM or local on-site control of the device). • Requirement: The configuration mode "Configuration" must be selected.	300 s	300 s
Last battery change	Shows the date on which the "Battery change" button was last pressed. • If the WirelessHART adapter is not connected to the network during the initial commissioning, the date is set to 01.01.1970. • The first time is is connected to the network manager, the date is updated.		

Parameter	Meaning	Example	Default
Temperature min.	Lowest temperature in degrees Celsius that the WirelessHART adapter was subjected to since the last time the temperature was reset.	-10 °C	
Temperature max.	Highest temperature in degrees Celsius that the WirelessHART adapter was subjected to since the last time the temperature was reset.	50 °C	
Reset temp max/min	By pressing this button, the minimum and maximum values of the temperature are reset.		
Normalized consumed energy	Current taken from the battery unit since the last battery change. • This value is not the actual consumption of the WirelessHART adapter but the chemical energy consumption of the battery unit.	5.1 Ah	

9.10 Optimization of the power supply (supply by the adapter)

Parameters to be optimized

If you use field devices that are supplied by the adapter, it may be necessary to optimize settings for the power supply.

Parameter	Meaning	Example	Default
Start-up voltage	Voltage in volts that the connected field device requires in the range 8 ... 23 V in steps of 0.1 V	14 V	16 V
Start-up time	Time in seconds during which the field device requires the "start-up voltage".	5 s	5 s
Start-up current	Current in milliamperes required by the field device for the "start-up time".	14 mA	14 mA
Operating voltage	Voltage in volts that the field device requires in normal operation after the "start-up time".	12 V	16 V
Lead time	Time in seconds after the "start-up time" that the field device requires to provide valid measured values.	10 s	10 s

Optimum parameter settings

Note

Multidrop mode

If power supply of a field device takes place via the adapter, we recommend that you operate the field device in multidrop mode. This mode keeps the power output more or less constant at 4 mA so that less energy will be consumed than with active power output.

Note

Reduced battery life

The power supply of a field device with the adapter reduces the life of the adapter battery.

Depending on the set parameters and the environmental conditions, battery life may be less than one year.

The adapter constantly calculates the expected battery life and indicates the remaining life users can expect. You can read out the currently anticipated battery life with a configuration tool.

The following table lists the ideal power supply settings for Siemens field devices:

Field devices	Parameter				
	Start-up time	Start-up voltage	Start-up current	Operating voltage	Lead time
SITRANS P DSIII	15 s	12 V	3.55 mA	10.5 V	300 s
SITRANS P300	15 s	12 V	3.55 mA	10.5 V	300 s
SITRANS TF (with TH300 V1)	2 s	13.5 V	3 mA	13.5 V	0 s
SITRANS TH300 V2	2.5 s	12 V	3 mA	12 V	0 s

See also

Siemens HART field devices for the adapter (Page 22)

Two-wire field device with external power supply (Page 37)

Maintenance and service

10

10.1   Replacing the battery unit

Maintenance of the battery unit

Apart from replacing the battery unit, no specific maintenance of the WirelessHART adapter is necessary.

- To replace the battery unit, you need to open the housing.

⚠ WARNING
Risk of explosion
The housing of the WirelessHART adapter must not be opened inside hazardous areas.
See also the section "Occupational health and safety" (Page 11).

CAUTION
Battery unit
Use of non-approved or damaged battery units may result in damage to the device or in the environment.
Only use the battery type approved by the manufacturer. Before you install or remove a battery unit, make sure that it is not damaged.

Note
Qualified Personnel

Installation and removal of the battery unit must only be carried out by qualified personnel. Additional information is available under: Qualified Personnel (Page 9) .

Replacing the battery unit

To replace the battery unit, follow these steps:

1. Disconnect the battery connecting cable from the socket on the board cover.

2. Press in the two clips of the battery unit towards the center of the battery unit at the same time and remove the discharged battery unit.

3. Insert the new battery unit in the compartment and make sure that the clips of the battery unit lock audibly into the indentations at the top and bottom of the compartment.

4. Plug the battery connecting cable into the socket on the board cover.

Note

Update date of last battery change

Please remember that after replacing the battery unit in SIMATIC PDM, the "Battery change" button must be pressed so that the WirelessHART adapter sets the date of the "last battery change" to the current date. See also the section "Configuring the power supply". (Page 62)

10.2   Return process for battery-operated devices

⚠️ **WARNING**

Remove the battery unit before returning the device

Before returning the device, remove the battery unit. Battery units must not be returned. Lithium thionyl chloride high-performance batteries belong to dangerous goods class 9: Miscellaneous hazardous materials and substances. Read the accompanying safety data sheet.

Return procedure

Attach the bill of lading, returned goods document and decontamination certificate in a firmly affixed clear plastic pouch on the outside of the packaging.

Required forms

- **Bill of lading**
- **Return document** with the following information:

    Return document (http://support.automation.siemens.com/WW/view/en/16611889)

    – Product (item description)

    – Number of returned devices/replacement parts

    – Reason for returning the item(s)

- **Decontamination declaration**

    Decontamination declaration (http://www.siemens.com/sc/declarationofdecontamination)

    With this declaration you warrant "that the device/replacement part has been carefully cleaned and is free of residues. The device/replacement part does not pose a hazard for humans and the environment."

    If the returned device/replacement part has come into contact with poisonous, corrosive, flammable or water-contaminating substances, you must thoroughly clean the device/replacement part before returning it, in order to ensure that all hollow areas are free of hazardous substances. Check the item after it has been cleaned.

    Any devices/replacement parts which are returned without a decontamination declaration will be cleaned at your cost before further processing.

The form is available on the Internet.

10.3 Disposal

NOTICE
Environmental protection
The high-performance battery used contains lithium thionyl chloride. The internal components of the battery must not pollute the environment.
• Do not dispose of the battery in the domestic refuse.
• Make sure that you observe the waste disposal regulations in your country.

Please contact your regional partner concerning the procedure for replacing old batteries. You can find additional information in the Internet at: Partner (http://www.automation.siemens.com/partner)

A Appendix

A.1 Technical data

A.1.1 Technical data

The following section contains the most important technical specifications:

For battery-operated version	
• Battery type	Lithium thionyl chloride high-performance battery unit
• Battery life	Varies with application:
	Up to 5 years depending on the updating of process variables, the field device type and the ambient conditions
• Supply voltage	5 V ... 7.2 V
• Supply current	< 250 mA
Transmitter frequency band	2.4 GHz (ISM)
Transmission range under reference conditions	• Outdoors up to 250 m
	• Indoors up to 50 m
Communication interfaces	• Input for 4 ... 20 mA and/or HART field devices
	• Input/output for HART communication
Auxiliary power	Battery
Input and output connection values of the terminals	
• Power supply for field devices (terminal 1)	No-load voltage can be set between 8 V and 23 V in steps less than 0.1 V
	Electric current: 4 mA DC ≤ I_{out} ≤ 20 mA
• 4 ... 20 mA/HART input (terminal 2)	4 mA DC ≤ I_{in} ≤ 20 mA
• High-resistance HART input/output connectors (terminals 4, 5, 6):	• Input impedance 3.7 kΩ for HART communication
	• Input impedance DC = ∞
• Maximum permitted terminal voltage	30 VDC
Degree of protection	IP65; IP66
	NEMA4
Dimensions with antenna aligned vertically pointing up (W x H x D) in mm	110.4 x 192 x 100.6

Thread	Can be mounted on field devices using coupler with:
	• M20
	• G1/2
	• NPT1/2
	• NPT3/4
Housing	Polyester IP66
	Aluminum IP66
Weight (approx.)	• Without battery unit: 0.5 kg
	• With battery unit: 0.785 kg
Climate class	4K4H complying with EN 60721-3-4 (stationary use at locations not protected from weather)
Ambient temperature	-40 °C ... +80 °C
	At ambient temperatures below -50 °C, the battery is no longer functional. If the temperature rises above -30 °C again, the battery becomes functional again.
Storage temperature	-40 °C ... +85 °C
	With battery unit installed:
	Below +30 °C; do not store in the vicinity of heating appliances; protect from direct sunlight.
Temperature limitations	See: Temperature limitations (Page 73)
Impact resistance	Complying with IEC68-2-27
	15 g, 11 ms
	1 shock in plus and minus direction in each of the 3 orthogonal main axes of the test specimen
Vibration resistance	Complying with IEC68-2-64
	$20 \leq f \leq 2000$ Hz
	0.01 g²/Hz

A.1.2 Temperature limitations

Minimum operating temperatures

The following listed temperature limits are based on a battery capacity of at least 30%.

The tables include the minimum operating temperatures in °C at 4 mA and 22 mA or between 4 mA and 22 mA in steps of 2 V of the maximum no-load voltage of the field device.

Adapter in 4 ... 20 mA supply mode

The operating range is limited with high measuring currents reaching 22 mA.

Max. no-load voltage of the field device	Temperature limitation in case of electric current	
	4 mA	22 mA
8 V	-40 °C	-30 °C
10 V	-40 °C	-30 °C
12 V	-40 °C	-30 °C
14 V	-40 °C	-25 °C
16 V	-40 °C	-25 °C
18 V	-40 °C	-
20 V	-40 °C	-
22 V	-40 °C	-

Adapter in multidrop mode

No-load voltage of the field device	Temperature limitation in case of start-up current [1]									
	4 mA	6 mA	8 mA	10 mA	12 mA	14 mA	16 mA	18 mA	20 mA	22 mA
8 V	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
10 V	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-35 °C	-35 °C
12 V	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-35 °C	-35 °C
14 V	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-35 °C	-35 °C	-35 °C	-35 °C
16 V	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-35 °C	-35 °C	-35 °C	-30 °C	-30 °C
18 V	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-35 °C	-35 °C	-30 °C	-30 °C	-25 °C
20 V	-40 °C	-40 °C	-40 °C	-35 °C	-35 °C	-35 °C	-30 °C	-30 °C	-25 °C	-25 °C
22 V	-40 °C	-40 °C	-40 °C	-35 °C	-35 °C	-35 °C	-30 °C	-30 °C	-25 °C	-25 °C

[1] Information of start-up current is available in the following sections:
- Configuring power supply (Page 62)
- Optimization of the power supply (supply by the adapter) (Page 65)

A.2   Spare parts and accessories

Various accessories and spare parts are available for the WirelessHART adapter and can be ordered separately:

● Battery unit SITRANS AW200

● Mounting support, wall/pipe

● Adapter set M20,

● Adapter set NPT 1/2

● Adapter set G 1/2

● Adapter set NPT 3/4

A.3 Technical support

Technical Support

You can contact Technical Support for all IA and DT products:

- Via the Internet using the **Support Request:**
  Support request (http://www.siemens.com/automation/support-request)

- E-mail (mailto:support.automation@siemens.com)

- **Phone:** +49 (0) 180 5050 222
  (0.14 €/min for calls from the German fixed network, different prices possible for calls from cellular phone networks)

- **Fax:** +49 (0) 180 5050 223

Further information about our technical support is available in the Internet at
Technical Support (http://www.siemens.com/automation/csi/service)

Service & Support on the Internet

In addition to our documentation, we offer a comprehensive knowledge base online on the Internet at:

Services & Support (http://www.siemens.com/automation/service&support)

There you will find:

- The latest product information, FAQs, downloads, tips and tricks.

- Our newsletter, providing you with the latest information about your products.

- A Knowledge Manager to find the right documents for you.

- Our bulletin board, where users and specialists share their knowledge worldwide.

- You can find your local contact partner for Industry Automation and Drives Technologies in our partner database.

- Information about field service, repairs, spare parts and lots more under "Services."

Additional Support

Please contact your local Siemens representative and offices if you have any questions about the products described in this manual and do not find the right answers.

Find your contact partner at:

Partner (http://www.automation.siemens.com/partner)

A signpost to the documentation of the various products and systems is available at:

Instructions and Manuals (http://www.siemens.com/processinstrumentation/documentation)

Index

Transmitter frequency band, 71
Two-wire field device, 21, 36

U

Union nut, 34
Unpacking, 55

V

Vibration, 17, 29
Vibration resistance, 72
Visual inspection, 15
Viton seal, 27

W

Wall, 24, 29, 32
Weight, 72
Wired communication
    Configuring parameters, 54
Wireless communication
    Configuring parameters, 52
Wireless module, 19
Wireless signal, 19, 29, 52
Wiring, 33, 35
Wrench, 24

www.siemens.com/processinstrumentation

www.siemens.com/processautomation