

# Technical Information

## WirelessHART Fieldgate SWG70

**WirelessHART™**



### Intelligent WirelessHART gateway with Ethernet and RS-485 interfaces

#### Application

Fieldgate SWG70 serves as a gateway device for WirelessHART networks. It enables WirelessHART devices to communicate with each other and manages security and connectivity. Fieldgate converts and stores wireless device data in a format that is compatible with other systems. It has Ethernet and serial interfaces for connection to host applications such as SCADA tools.

#### Features and Benefits

- Gateway, Network Manager, and Network Access Point capabilities according to the WirelessHART specification: works with all WirelessHART adapters and devices
- RS-485 and Ethernet interfaces with support of HART and Modbus: network data easily integrated into existing system
- Flexible configuration and parametrization via FDT/DTM or Web-Interface: clear presentation of network, measured values and diagnosis information
- Local or Remote antenna options: easily adapted to local installation conditions

## Function and System Design

### WirelessHART

WirelessHART is a HART Communication Foundation specification for use in process automation. It adds wireless capabilities to the HART protocol while maintaining compatibility with existing HART devices, commands, and tools.

A WirelessHART network comprises:

- Wireless field devices
- Non-wireless field devices enhanced by using a WirelessHART adapter
- Gateways that enable communication between devices and host applications
- A Network & Security Manager responsible for configuring, managing and monitoring the network.

### WirelessHART Fieldgate SWG70

Endress+Hauser's SWG70 WirelessHART Fieldgate has been designed to act as interface between a system using Ethernet or RS-485 physical layer and the WirelessHART network.

It supports the following functions:

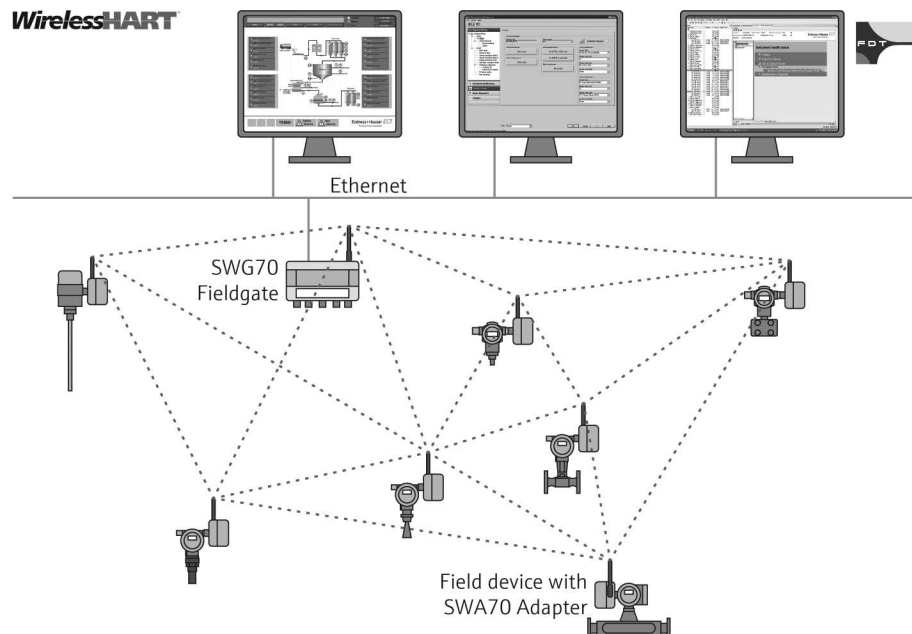
- Wireless network configuration and management
- Acquisition of data from the network devices and presentation to the connected system
- Web server supporting HART and MODBUS protocols for data transfer
- Network, Fieldgate and device configuration via Web interface or FDT/DTM.

The gateway is designed for mounting in explosion hazardous areas Zone 2 and has an intrinsically safe antenna port. An integral or remote antenna can be mounted according to the needs of the application.

### System design

The WirelessHART Fieldgate stores information received from the WirelessHART Adapter SWA70 or other WirelessHART device in a buffer which can be accessed by a host application over an Ethernet or RS-485 connection. The figure below shows it operating in a typical meshed WirelessHART network architecture.

#### Typical WirelessHART network



## Input

<b>Wireless interface</b>	WirelessHART communication interface (IEC 62591)
<b>Physical layer</b>	IEEE 802.15.4; 2006
<b>Transmission rate</b>	Nominal 250 kbits/s
<b>Operating frequency</b>	2.4 GHz (ISM band)
<b>Transmission range</b>	Under reference conditions: Outdoor 250 m, indoor 50 m
<b>RF power level</b>	Configurable 0 dBm or 10 dBm, depending upon national regulations
<b>Input variables</b>	<ul style="list-style-type: none"> <li>▪ Process variables according to HART standard sent in burst mode by devices in network</li> <li>▪ Up to 250 WirelessHART devices can be connected</li> </ul>
<b>Additional functions</b>	<ul style="list-style-type: none"> <li>▪ Security mode for join key and network ID download (enabled by DIP switch)</li> <li>▪ Buffering of process values for acquisition by host application</li> </ul>

## Output

### Ethernet (100 BASE-T / 100 BASE TX)

<b>Protocol</b>	Configurable for HART-IP and MODBUS-TCP communication
<b>Transmission rate</b>	100 Mbit/s (max. cable length 100 m at 25 °C ambient temperature)
<b>Type of protection</b>	None
<b>Galvanic isolation</b>	Fully isolated from all other circuits
<b>Maximum bus length</b>	100 m (110 yds) depending upon cable
<b>Connection facilities</b>	<ul style="list-style-type: none"> <li>▪ 7-port terminal block</li> <li>▪ Screw terminals: 0.2 mm<sup>2</sup> to 4 mm<sup>2</sup> for solid wire, 0.2 mm<sup>2</sup> to 2.5 mm<sup>2</sup> for stranded wire</li> </ul>

### RS-485 serial interface

<b>Protocol</b>	Configurable for HART Version 7.0 or MODBUS-RTU communication
<b>Transmission rate</b>	Hardware or software configurable between 1200 bit/s to 115200 bit/s
<b>Type of protection</b>	None
<b>Galvanic isolation</b>	Fully isolated from all other circuits
<b>Maximum bus length</b>	1200 m (1230 yds), depending upon cable and transmission rate
<b>Terminal resistor</b>	Integrated, settable by hardware (DIP-switch) or software
<b>Connection facilities</b>	<ul style="list-style-type: none"> <li>▪ Two 3-port terminal blocks, allowing series connection of several gateways</li> <li>▪ Screw terminals: 0.2 mm<sup>2</sup> to 4 mm<sup>2</sup> for solid wire, 0.2 mm<sup>2</sup> to 2.5 mm<sup>2</sup> for stranded wire</li> </ul>

## Power Supply

<b>Power supply</b>	20 VDC to 30 VDC
<b>Power</b>	<5 W
<b>Connection facilities</b>	<ul style="list-style-type: none"> <li>■ Two 2-port connection block, 2nd port for redundant power supply</li> <li>■ Screw terminals: 0.2 mm<sup>2</sup> to 4 mm<sup>2</sup> for solid wire, 0.2 mm<sup>2</sup> to 2.5 mm<sup>2</sup> for stranded wire</li> </ul>

## Operating Conditions

### Installation

<b>Installation instructions</b>	<p><b>Location:</b> If possible, avoid mounting too near pipes, heavy-duty electrical equipment etc. Fieldgate should be in radio contact with at least 20 % of all wireless devices or adapters. Maximum separation 250 m outdoors, 50 m indoors under typical conditions</p> <p><b>Mounting:</b> Remote antenna can be mounted outside of a cabinet.</p> <p><b>Orientation:</b> With antenna vertical.</p> <p><b>Ex-Area:</b> Fieldgates with certificate, see Ordering Information, may be mounted in Zone 2. The front panel can be opened in Zone 2 to view the LEDs. Operation of the DIP switches and pushbuttons is not allowed in the presence of an explosive atmosphere.</p>
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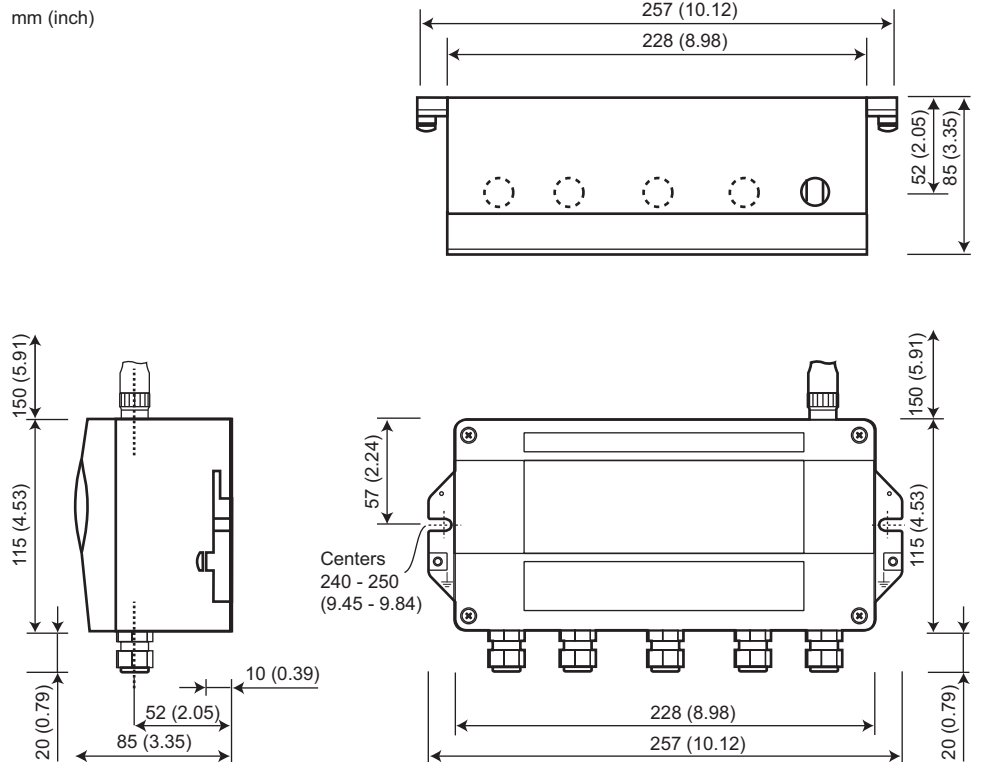
### Environment

<b>Ambient temperature range</b>	-20 °C to +60 °C / -4 °F to 140 °F
<b>Storage temperature</b>	-40 °C to +85 °C / -40 °F to +185 °F
<b>Relative humidity</b>	5 % to 95 %, non-condensing
<b>Vibration resistance</b>	EN 60068-2-6: 10 Hz ≤ f ≤ 150 Hz/1g
<b>Shock resistance</b>	EN 60068-2-27: 15 g, 11 ms
<b>Electromagnetic compatibility</b>	<p>Complies with the requirements of the EC Directive 2004/108/EG "Electromagnetic Compatibility"</p> <ul style="list-style-type: none"> <li>■ IEC 61326: <ul style="list-style-type: none"> <li>- Immunity: EN 61326-1: 2006, industrial environment</li> <li>- Emission: EN 61326-1: 2006, Class A equipment</li> </ul> </li> </ul>
<b>Telecommunication compliance</b>	<p>Complies with the requirements of the EC Telecommunications Directive 99/5/EG</p> <ul style="list-style-type: none"> <li>■ ETSI EN 300 328: V1.7.1 (2006-10)</li> <li>■ ETSI EN 301 489-17: V1.2.1 (2002-08)</li> <li>■ EN 60950:2001</li> </ul>

## Mechanical Construction

### Overall dimensions

W x H x D: 257 mm x 85 mm x 285 mm with cable glands and antenna  
 257 mm x 85 mm x 115 mm without cable glands and antenna



<b>Weight</b>	Approx. 1.6 kg
<b>Housing</b>	<ul style="list-style-type: none"> <li>■ Material: Painted aluminum</li> <li>■ Color: Light grey, RAL 7035</li> </ul>
<b>Degree of protection</b>	IP 65; NEMA Type 4
<b>Type of protection</b>	<p>Complies with the requirements of the EC Directive 94/9/EG (ATEX)</p> <ul style="list-style-type: none"> <li>■ "nA", non-sparking to EN 60079-15:2005</li> </ul>
<b>Cable Entry</b>	5 separate M20x1.5 threaded entries
<b>Antenna</b>	<ul style="list-style-type: none"> <li>■ Omnidirectional dipole antenna</li> <li>■ Intrinsically safe antenna port</li> <li>■ Remote antenna available on request</li> </ul>

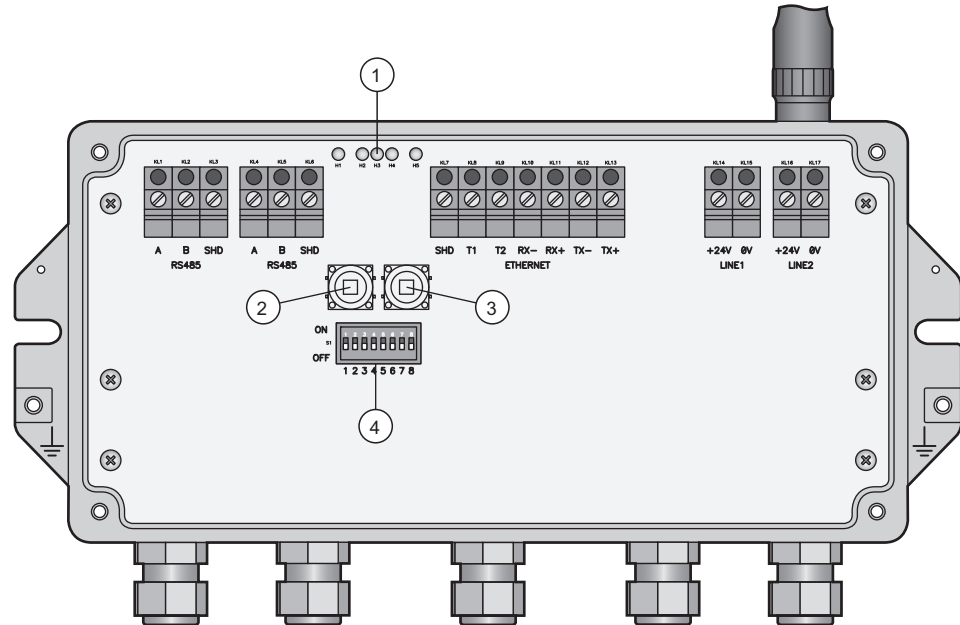
## Operability

### Configuration

- Web browser via Ethernet
- FieldCare via Ethernet (HART-IP CommDTM) or RS-485 (serial CommDTM)

### Operating elements

- Operating elements are located within the housing
- The front cover can be removed in Zone 2. The connection of cables in Zone 2 is permitted only in the absence of any explosive atmosphere or with the power turned off.



- ① Five LEDs, from left to right:
  - Yellow LED: RS-485 communication status
  - Green LED: Power supply
  - Yellow LED: WirelessHART communication status
  - Red LED: Fault
  - Yellow LED: Ethernet communication status
- ②, ③ Two pushbuttons "P1" and "P2"
  - Button P1: Reset to default fieldgate configuration
  - Button P2: Reset to default communication channel configuration
  - Button P1 and P2: Reset passwords, and if security mode enabled, reset join key and network ID
- ④ Bank of eight DIP switches
  - Switches 1 – 4: Polling address, 0 to 15 (by software from 0 to 63)
  - Switches 5 – 6: Serial baudrate, 9600 bit/s, 19200 bit/s, 38400 bit/s, 57600 bit/s (by software from 1200 bit/s to 115200 bit/s)
  - Switch 7: RS-485 termination, disconnected, connected (also configurable by software)
  - Switch 8: Security mode, disabled, enabled

### Configurable functions

- Wireless network
- HART, Modbus and Ethernet communication interfaces

### Diagnosis

- Display of wireless instrument list with process values of selected device
- Display of wireless instrument list with burst message identification of selected device
- Network monitoring of wireless communication events
- Diagnosis function

## Ordering Information

### Product structure

Detailed information on the product structure is available:

- In the Product Configurator on the Internet page: [www.endress.com](http://www.endress.com) → Select country → Products → System components & recorders → Wireless Communication → WirelessHART Fieldgate SWG70 → Product page function: Configure this product
- At your Endress+Hauser Sales Center: [www.addresses.endress.com](http://www.addresses.endress.com)

### Accessories

- Remote antenna
- Further accessories on request

## Documentation

### WirelessHART Fieldgate SWG70

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|--|---|
| <input type="checkbox"/> WirelessHART Fieldgate SWG70<br>Operating Instructions BA00064S/04/en | <input type="checkbox"/> WirelessHART Adapter and Fieldgate<br>Competence Brochure CP013S/04/en |
| <input type="checkbox"/> WirelessHART Adapter SWA70<br>Operating Instructions BA00061S/04/en   |   |

## Certificates and Approvals

### CE Mark

In attaching the CE Mark, Endress+Hauser confirms that WirelessHART Fieldgate SWG70 conforms to all relevant EU directives.

### Telecommunication Approval

- Brazil: ANATEL 2759-11-7311 (EAN Number: 7898994191414)
- China: CMIIT ID (SRRC)
- ETSI (R&TTE)
- FCC Part 15.247 for wireless applications in the 2.4 GHz frequency band
- Japan: Ministry of internal affairs and communication
- Mexico: COFETEL RCEPNSW12-0651
- Other national certificates are available on request.

Additional national guidelines to be observed

Country	Guideline
Bulgaria	General authorization required for outdoor use and public service
Italy	If used outside of own premises, general authorization is required
Norway	May be restricted in the geographical area within a radius of 20 km from the center of Ny-Alesund
Rumania	Use on a secondary basis. Individual license required
Latvia	The outdoor usage of the 2,4 GHz band requires an authorization from the Electronic Communications Office

### Hazardous area approvals

See ordering information.

[www.addresses.endress.com](http://www.addresses.endress.com)

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