

Technical Information

WirelessHART Adapter SWA70

WirelessHART™

Intelligent WirelessHART interface module
for connection to 4...20 mA/HART devices



Application

WirelessHART Adapter SWA70 is an interface module that connects HART and 4...20 mA devices to a WirelessHART network. It is powered either by a battery or an electronically regulated power pack. The adapter is suitable for several applications, for example:

- **Process optimization:**
Connection of the WirelessHART Adapter allows plant sections to be monitored and optimised at little cost and effort.
- **Tank and silo monitoring/Inventory control:**
Measured values together with device and battery status are transmitted at regular intervals to a higher level system
- **Condition monitoring of equipment:**
Wireless devices are added at critical points in the plant not normally connected to the control room due to accessibility or wiring costs. Improved data flow and diagnostics increase plant reliability and safety.

Features and Benefits

The flexible adapter concept brings the following advantages:

- HART devices quickly upgraded to WirelessHART technology
- 4...20 mA devices quickly integrated into the WirelessHART network
- One 4...20 mA or up to four HART devices can be connected (in multidrop mode) to one adapter
- Burst mode and event notification supported for adapter and connected devices
- Remote and difficult-to-access HART devices connected to the plant control room without expensive cables
- Simple planning, easy installation and quick integration

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
- Wired field devices with 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 Adapter SWA70

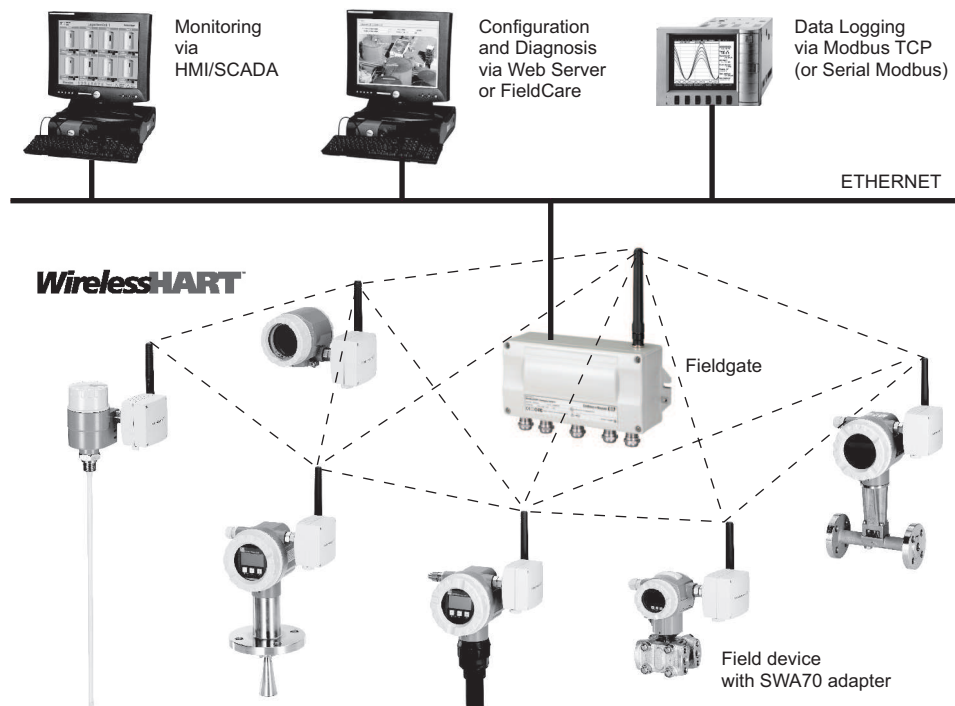
Endress+Hauser's SWA70 WirelessHART Adapter has been designed to act as an add-on interface for any HART or 4...20 mA device. It supports the following functions:

- Powering of one HART or one 4...20 mA device
- Wide-range power pack: connection of up to four HART devices in multidrop mode
Battery power pack: connection of up to four externally powered HART devices in multidrop mode
- Scaling of current signal supplied by a connected 4...20 mA device
- Burst mode and event notification for both itself and the connected devices.

Depending on the option selected, adapter power may be supplied by battery, AC or DC line, solar unit or an Ex-certified power unit. The battery has been specially selected to give long life when used in monitoring applications.

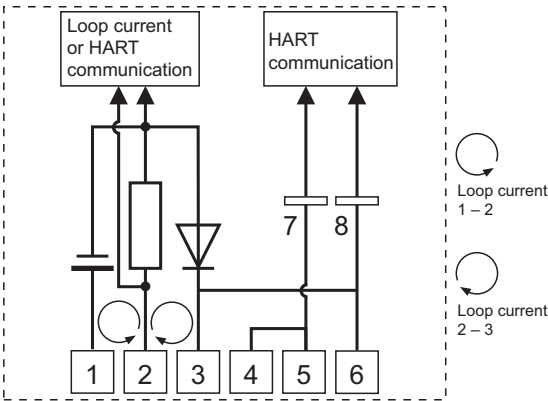
System design

WirelessHART Adapter SWA70 transmits its information to a host application through a WirelessHART Fieldgate. The figure below shows a typical meshed WirelessHART network architecture.



Input

Wired interface	One device input channel for: One point-to-point with a HART device, or One point-to-point connection with a 4...20 mA device, or Up to four HART devices operating in multidrop mode (powering depends upon adapter version)	
Communication type	HART communication in multidrop mode, 4...20 mA current signal in point-to-point mode	
Protocol version	HART Version 7.0 (backwards compatible with previous HART versions)	
Transmission rate	1200 bits/s for HART multidrop	
Type of protection	Intrinsically safe and dust Ex versions available, see Ordering Information	
Device loop-power	Current:	4 mA to 20 mA (according to NAMUR recommendation NE 43) or 4 mA when operating in multidrop mode
	Fault current:	≤ 3,6 mA or I ≥ 21 mA
	Protection:	Short-circuit protected, triggered for currents > 25 mA
	Supply voltage:	8 to 23 V DC
Connection facilities	Adapter SWA70 has a six-pole screw terminal block (Terminals 1 – 6) and two eyelets (Terminals 7 and 8).	



Terminal	Description
1 and 2	▪ Device power supply ▪ HART/4...20 mA input
2 and 3	HART/4...20 mA input
4 or 5	HART high impedance input/output
3 or 6	HART high impedance input/output and ground
7 and 8	Connection HART modem

Cable	▪ Adapter mounted directly on device: cables supplied ▪ Separately mounted adapter: standard installation cable
Device connection	Depending upon the adapter version, the following loop connections can be made. Power by battery or solar module: ▪ Connection of a field device in a control loop without communication resistor ▪ Connection of a field device in a control loop with communication resistor ▪ Connection of loop-powered device (2-wire device) ▪ Connection of a 4-wire device

Wide-range power supply:

- Connection of a field device in a control loop without communication resistor
- Connection of a field device in a control loop with communication resistor
- Connection of an internally powered 24 V DC 2-wire device (active loop-powered device)
- Connection of a 4-wire device
- Connection of up to four HART devices operating in multidrop mode

Intrinsically safe power supply:

- Connection of a field device in a control loop without communication resistor
- Connection of a field device in a control loop with communication resistor
- Connection of a loop-powered device (2-wire device)
- Connection of a 4-wire device

Output

Wireless interface	WirelessHART communication interface (IEC 62591)
Transmission rate	Nominal 250 kBits/s
Operating frequency	2.4 GHz (ISM band)
Transmission range	Under reference conditions: Outdoor 250 m, indoor 50 m
RF power level	Configurable 0 dBm or 10 dBm, depending upon national regulations
Output variables	<p>Output configurable according to user requirement</p> <ul style="list-style-type: none"> ■ Adapter: loop-current and up to three other variables selectable from adapter temperature, battery voltage, energy consumed, estimated battery life-time ■ 4...20 mA device: scaled or linearized process value ■ HART device: up to four process variables (configured through Fieldgate/gateway)
Additional functions	<ul style="list-style-type: none"> ■ Burst mode, configurable for up to eight variables from adapter and/or connected device(s) ■ Event notification, configurable for up to eight variables from adapter and/or connected device(s) ■ Fault recognition and scaling or linearization of 4...20 mA signal of connected analog device ■ Monitoring of energy consumption ■ Locking/unlocking of device parameterization
Diagnosis	Diagnosis function in accordance with NAMUR NE 107, ASM and HART recommendations

Power Supply

Power pack versions	<ul style="list-style-type: none"> ■ Battery: special long life lithium thionylchloride battery pack ■ Wide-range power supply ■ Intrinsically safe power supply ■ Solar module
Supply voltage	<p>For versions with electronically regulated power pack:</p> <ul style="list-style-type: none"> ■ Wide-range power supply: 24 V...230 V AC/DC $\pm 10\%$, 50/60 Hz ■ Intrinsically safe power supply: 8 V...30 V DC ■ Solar module: 8 V...50 V DC <p>In the event of an external power supply failure, wireless communication is maintained for at least one hour by means of an internal power supply.</p>

Current consumption	For versions with electronically regulated power pack <ul style="list-style-type: none">■ Wide-range power supply: < 350 mA, a 1 A slow-blow fuse is to be installed in series by customer■ Intrinsically safe power supply: < 250 mA, a 1 A slow-blow fuse is to be installed in series by customer■ Solar module: < 100 mA, field device is not powered by adapter
Power	For versions with electronically regulated power pack <ul style="list-style-type: none">■ Wide-range power supply: 7 W or 12 VA, depending on voltage type■ Intrinsically safe power supply: < 2.2 W■ Solar module: < 0.1 W
Battery rating	19 Ah nominal capacity at 20°C
Battery life	5–7 years, dependent upon update rate of process variables, instrument type and environmental conditions

Performance

Applies to analog current signal circuit.

Reference conditions	to IEC 61298 Part 2
Measured error	4...20 mA circuit: 0.125% of span
Influence of ambient temperature	4...20 mA circuit: 5 µA/10K

Operating Conditions

Installation

Installation instructions	<div>Location: If possible, avoid mounting too near walls, pipes, heavy-duty electrical equipment etc. If possible, the adapter should be in line of sight with a neighbouring adapter or the Fieldgate. The development of the Fresnel Zone should be considered. Maximum separation under reference conditions: 250 m outdoors, 50 m indoors</div> <div>Mounting: Direct mounting on field device or separately mounted on wall (wall mounting kit available)</div> <div>Orientation: The antenna must be aligned vertically upwards.</div>
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Environment

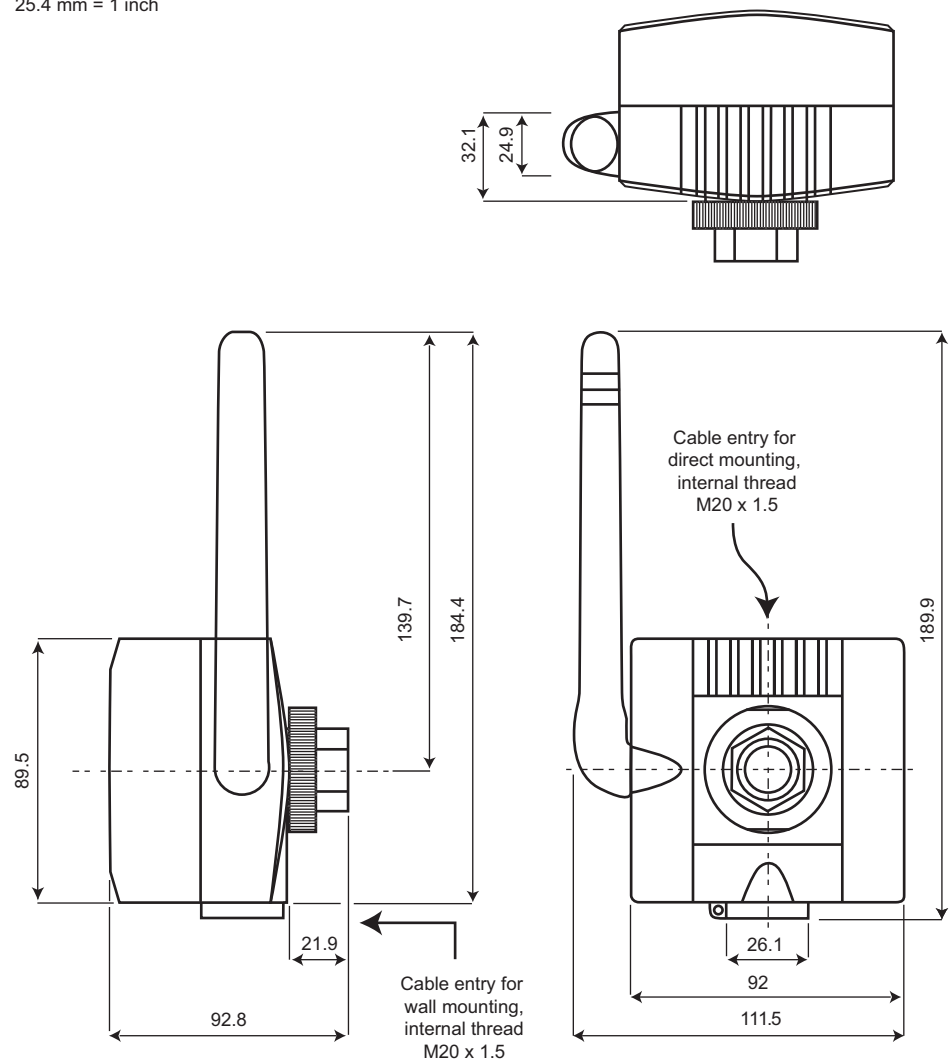
Climate Class	EN 60721-3-4: 4K4H, suitable for stationary use in unprotected outdoor locations
Ambient temperature	For battery version <ul style="list-style-type: none">■ -40 °C to +80 °C/-40 °F to 176 °F At temperatures below -30 °C/-22 °F the battery pack capacity decreases rapidly For versions with electronically regulated power pack <ul style="list-style-type: none">■ -40 °C to +80 °C/-40 °F to 176 °F At temperatures below -25 °C/-13 °F the period for which wireless communication is maintained after a power failure decreases rapidly
Storage temperature	<ul style="list-style-type: none">■ -40 °C to +85 °C/-40 °F to +185 °F, for battery version with battery pack removed■ < 21 °C/+70 °F with battery pack (recommended to minimize self-discharging)
Vibration resistance	EN 60068-2-64: 20 Hz ≤ f ≤ 2000 Hz: 0.01g ² /Hz

Shock resistance	EN 60068-2-27: 15 g, 11 ms
Electromagnetic compatibility	<p>This device complies with the requirements of the EC Directive 2004/108/EG "Electromagnetic Compatibility".</p> <ul style="list-style-type: none"> IEC 61326 / EN 61326: <ul style="list-style-type: none"> Immunity: EN 61326-1: 2006, Table 2 (industrial locations) Emission: EN 61326-1: 2006, Class A NAMUR recommendation EMC (NE 21), ESD behaviour "B"
Telecommunication compliance	<p>Complies with the requirements of the EC Telecommunications Directive 99/5/EG</p> <ul style="list-style-type: none"> EN 300 328: V1.7.1 (2006-10) EN 301 489-1: V1.8.1 (2008) EN 301 489-17: V2.1.1 (2009)

Mechanical Construction

Overall dimensions W x H x D: 111.5 mm x 189.9 mm x 92.8 mm

Dimensions in mm
25.4 mm = 1 inch



Weight	<ul style="list-style-type: none">▪ Polyester housing with power supply unit: 0.785 kg (1.74 lbs)▪ Aluminum housing with power supply unit: 0.9 kg (1.98 lbs)▪ AISI 316L housing with power supply unit: 1.9 kg (4.19 lbs)
Housing	<ul style="list-style-type: none">▪ Housing: polyester, aluminum or AISI 316L, see ordering information▪ Color: pale-gray, RAL 7035 with blue logo
Degree of protection	<ul style="list-style-type: none">▪ F32 polyester housing: IP65/IP66; NEMA Type 4▪ F33 aluminum housing: IP67, NEMA Type 4X▪ F39 AISI 316L housing: IP66/IP67; NEMA Type 4X
Cable entry	Two separate M20x1.5 threaded entries for direct or separate mounting
Mounting adapter	M20x1.5 to M20x1.5, M20x1.5 to G 1/2, M20x1.5 to NPT 1/2, M20x1.5 to NPT 3/4, see Ordering Information
Antenna	Omnidirectional dipole antenna: position adjustable in vertical plane.

Operability

Configuration	<ul style="list-style-type: none">▪ Local with FieldCare via HART modem and DTM for SWA70▪ Remote with FieldCare via WirelessHART Fieldgate SWG70 and DTMs for SWA70 and SWG70▪ Remote with Device Description (DD) based tools and gateways
Operating elements	<ul style="list-style-type: none">▪ Push button within housing for selecting operating mode during local configuration▪ LED within housing for indicating communication status, battery status and error messages
Device address	Configurable between 0 to 63 via DD or DTM, default 15

Ordering Information

Product Structure	Detailed information on the product structure is available: <ul style="list-style-type: none">▪ In the Product Configurator on the Internet page: www.endress.com → Select country → Products → System components & recorders → Wireless Communication → Wireless Adapter SWA70 → Product page function: Configure this product▪ At your Endress+Hauser Sales Center: www.addresses.endress.com
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Documentation

WirelessHART Adapter SWA70	<ul style="list-style-type: none"><input type="checkbox"/> WirelessHART Adapter SWA70 Operating Instructions BA00061S/04/en<input type="checkbox"/> WirelessHART Fieldgate SWG70 Operating Instructions BA00064S/04/en	<ul style="list-style-type: none"><input type="checkbox"/> WirelessHART Adapter and Fieldgate Competence Brochure CP013S/04/en
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Certificates and Approvals

CE Mark	In attaching the CE Mark, Endress+Hauser confirms that WirelessHART Adapter SWA70 conforms to all relevant EU directives.
Telecommunication Compliance	<ul style="list-style-type: none">▪ Brazil: ANATEL 2759-11-7311 (EAN No.7898994191421)▪ China: CMIIT ID (SRRC)▪ ETSI (R&TTE)▪ FCC Part 15.247 for wireless applications in the area of 2.4 GHz▪ Japan: Ministry of internal affairs and communication▪ Mexico: COFETEL RCEPNSW12-0650▪ Additional national certificates on request
Hazardous area approvals	See Ordering Information

www.addresses.endress.com